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Role of U.S. Department of Agriculture

Policies of National School Lunch Program[1]

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THE FEDERAL assistance program has done much to stimulate the growth and development of school food services. We in the Department of Agriculture want to see the federal effort continue to supplement effectively local and state efforts to expand and improve school food services. But this is not only a cooperative federal-state undertaking, it is also one kind of program for which the states and local governments should assume major responsibility. The central responsibility rests squarely at the local and state levels, and we applaud the way in which the local and state agencies have accepted their responsibilities, including financial, on a steadily increasing scale over the eleven years since the enactment of the National School Lunch Act.

History of School Lunch

We in the Department of Agriculture are proud—and we believe rightly so—of our early and continuing efforts to help develop school lunch programs. The story goes a long way back.

Before 1920, federal-state extension workers were encouraging and assisting rural schools to undertake hot lunch programs. Most of the time, this "lunch" consisted of nothing more than a dish of hot soup or a hot drink, but it was a beginning.

An important development was the Department's action in 1936 to make surplus food available to school lunch programs. I am aware that there were some who took a cynical view of the Department's motives. "A dumping ground for surpluses," they said. Such a view was not justified then or now.

School lunch programs in those years were not a large outlet for surplus foods. Of all the surplus foods that were distributed by the Department between 1936 and 1942, only 10 per cent actually went to schools. And when, in March 1943, wartime food demands had about eliminated the surplus problem, the Department took another important action to continue to support school lunches. It was then that we inaugurated the cash assistance program.

It was under this program that the now universally-accepted school lunch policies or standards were developed: the program should be nonprofit; the lunch served should meet good dietary standards; children unable to pay the full price of the lunch should be served free or at a reduced price. It was this assistance program which the Congress wrote into permanent legislation in the National School Lunch Act of 1946 on a grant-in-aid basis.

In those earlier years—as well as today—the Department's interest in school lunch programs stemmed from our basic belief that good dietary levels in this country will provide the most desirable, stable domestic food market for agricultural producers. We believe a sound school lunch program can help improve the diets and food habits of children and thus lead to better diets and better food habits for our population as a whole.

Perhaps the importance of school lunches has never been better summarized than by the Senate Committee on Agriculture when it reported the school lunch bill. This report said:

> The waste and the economic and social confusion that follows from the failure to utilize fully the extraordinary production of the United States is not a problem separable from that of assuring adequate nutrition for the people and especially for the children of the nation.

The report went on to outline three basic factors that were preventing adequate child nutrition and, thus, helping to limit food markets. First, there was lack of knowledge concerning the elements of good nutrition among many children and parents. Second, it was increasingly difficult for many children to obtain a good lunch on school days; bus rides were longer, and more mothers were working. Third, insufficient purchasing power limited a significant number of families' ability to buy a fully adequate diet. Then the Committee said:

> The school lunch program democratically resolves all of these difficulties. The children eat a common, well-chosen meal together and learn at the same time what they should eat. Those who cannot pay for the lunch need not pay and there is no discrimination attached to such nonpayment.

[1]Presented before the National Conference on School Lunch and Direct Distribution in Washington, D. C., on August 27, 1957.

These statements, we believe, are as valid today as they were when the National School Lunch Act was passed.

Basis of Federal Administrative Policies

Basically, federal policies governing the administration of a program authorized by the Congress stem from the letter and spirit of the legislation.

The legislation may be general in nature, outlining broad objectives and allowing considerable administrative flexibility in determining the activities or the methods to be used in achieving this objective. Our "Section 32" authority and the special milk legislation fall within this same category. Nevertheless, the flexibility provided in legislation of this type does not relieve us at either the federal or state level of the responsibility for demonstrating that we are using our authorities wisely and in the public interest. We must not only demonstrate that what we do is legal, but also that it is effective.

Suppose we now look a little more closely at the National School Lunch Act.

It defines *what* it wants accomplished: the kind of schools and the kind of lunch program to be assisted; the purpose for which the federal funds are to be used; the way the funds are to be divided among the states; and the way these funds shall be paid or distributed.

The Act also outlines *how* its objectives are to be accomplished. It assigns specific responsibilities to state educational agencies; it establishes specific minimum matching requirements for the federal funds; it directs the Secretary of Agriculture to enter into agreements with state educational agencies which incorporate the express requirements of the Act and "such other provisions as, in his opinion, are reasonably necessary or appropriate to effectuate the purpose of this Act."

What are the other necessary or appropriate provisions for effective administration of the National School Lunch Act? To what extent did the Congress intend that the Department of Agriculture establish additional, mandatory requirements as a condition for advancing federal funds? What basic guidelines should be followed in federal-state relationships under the Act? How far should the Department go in requiring that state agency performance meet certain standards or concepts of administrative management?

In my experience as an administrator of federal programs, one thing is clear. The Congress intends that the federal agency shall also take any action that is necessary to protect federal funds or the essential integrity of a federal program. Beyond this basic mandate, we also look to the spirit of the enabling legislation to guide us in the development of basic administrative policies for such an activity as the National School Lunch Program.

Legislative History of the School Lunch Act

To a considerable extent this "spirit"—this evidence of Congressional intent—is found in what is called "legislative history." We also look to the legislative history for guidance in clarifying ambiguous provisions of an act.

The legislative history may include a statement made by the sponsor when he introduces the bill into the Congress. The published report of the hearings on the bill is another source. The reports accompanying the bill when it is reported out of Committee help to explain Congressional intent or further clarify the purpose of specific provisions. Finally, there is the House and Senate debate on the bill which precedes its passage. And then, from year to year, there are hearings and reports on the appropriations for the particular activities, as well as legislative records of efforts, successful or not, to amend the original legislation. All of these proceedings help to interpret the intent of Congress.

The legislative history of the National School Lunch Act clearly shows that it was the intent of Congress that the federal assistance program supplement—rather than be a substitute for—state and local school lunch efforts. The Committee reports, the House and Senate debate, the questions we are often asked at appropriation hearings—all of these emphasize that the prime purpose of the Act is to assist and encourage the states to assume increasing financial and administrative responsibility for the School Lunch Program.

This intent, this spirit of the Act, has been a key to the Department's school lunch administrative policies. Over and above our continuing responsibility to insure that federal funds are as wisely used as our abilities allow, our school lunch administrative policies have been directed toward two long-range objectives:

(a) To permit the various states to develop the program in a manner best suited to the needs and resources of the various states.

(b) To assist state agencies to develop the kind of school lunch organization that could assume increasing responsibility for the operation of the program.

Evaluating Operations

At this point, I would like to mention that, as a result of discussions by our officer in charge of Audit and Appraisal with the school lunch directors in Chicago last fall, there has been increased interest among the states in developing their own individual school audit program. We stand ready to assist any state in taking on this additional responsibility for what I hope we can all agree is a necessary administrative arrangement.

These policies have meant that the Department

chiefly works for improvements in school lunch operations through a program of encouraging and assisting state agencies, rather than demanding fixed, uniform standards of performance under the threat of withholding federal funds. As you know, we have been criticized by the government's General Accounting Office and others for not taking a "firmer" attitude. We believe, however, that we have been able to defend our policies adequately. We have been able to demonstrate that there have been steady and significant improvements in the school lunch operations of state agencies. And we realize that this has been possible only because the states, too, have worked to administer the school lunch program within the letter and spirit of the law.

Both the states and the Department must share responsibility for obtaining further administrative improvements. For our part, we will continue to rely on a program of evaluating operations through administrative analyses and audits and of working directly with state school superintendents and school lunch directors.

Meanwhile, I am aware that many of the state people believe that we in the Agricultural Marketing Service devote too much attention to audit and appraisal activities. I want, therefore, to discuss some of the broad areas of responsibility within our agency, especially as they relate to action activities, such as the national School Lunch Program.

Program operations within the Agricultural Marketing Service are decentralized. The basic responsibility for an action program rests with the operating division—in this case, the Food Distribution Division. We rely on this Division to operate the school lunch program within approved policies and procedures. This Division is also responsible for appraising the effectiveness of program operations and recommending needed or desirable changes in policies and procedures.

But within the entire federal government—as well as in the Department of Agriculture and the Agricultural Marketing Service—the organizational pattern provides for internal audit and appraisal. This function is not limited to fiscal accountability. It encompasses a broad program of independent evaluation of the effectiveness, administrative problems, and fiscal results of these programs. Further, this function should be carried out by a group which is independent of those directly in charge of administering the particular program under review.

Obviously, our auditors cannot evaluate the effectiveness of the school lunch program without looking at actual operations. How can this function best be performed?

Where Do We Stand Today?

Thus far my remarks have been largely confined to matters concerned with federal-state program administration. However, sound administration is only a means of accomplishing program objectives. The real test of our joint efforts is the progress we have made in developing school lunch programs and relating that progress to the things that remain to be accomplished.

We have been convinced for some time that neither the Department nor the states had sufficient information to evaluate over-all school lunch progress, i.e., what needs were being met, what needs were as yet unfilled, what was the relative importance of the various factors that affect a child's participation in the food service provided by a school.

As a result, our research people, working with the Food Distribution staff, are now engaged in a survey of the current status of school food services. Fortunately, some of the findings are now available. The Bureau of the Census, which sent out our questionnaires and ran the basic tabulation, recently released some 150 work tables to us. You will find such analyses and summary tables as could be completed in the preliminary report from our Marketing Research Division in *Participation of Schools and Pupils in the School Lunch and Special Milk Programs in March 1957* (1). Because of sampling problems, the survey was confined to public schools. However, we believe that this coverage does provide an adequate basis for evaluating the status of the total program.

In my all-too-brief review of this preliminary report, I feel these are some of the significant school lunch findings:

(a) In March 1957, seven of every eight public schools (86.8 per cent) serving lunches (either plate or à la carte) were in the national School Lunch Program.

(b) Twenty-two million—or about two-thirds of the almost 33 million children in public schools—attended schools participating in the national School Lunch Program. On the average, 9.9 million of these children were eating the complete plate lunch each day.

(c) Another 3 million were attending schools outside the national School Lunch Program that offer a plate-lunch combination. And, on the average, 1 million of these children were buying that plate lunch each day.

(d) Another million children attended schools which provided only an à la carte food service.

(e) *But*, almost 6½ million children attended schools where no lunch was served, although many of these schools did provide a milk service for children.

Summarizing another way, we find this total picture: About 25 million of the almost 33 million children in public schools attend schools that offer a complete plate lunch. But, on the average, only about 11 million children eat this plate lunch each day.

Also, we have about 7½ million children who do not have an opportunity for a complete plate lunch at school.

Here we have a picture of the progress that has been made and the job that lies ahead. I do not believe it would be practical to assume—at least under present-day educational patterns—that 100 per cent of the children attending school would eat a plate lunch at school. However, some of our people suggest we set a practical maximum potential of about two-thirds—or about 22 million of the children now attending public schools.

We now have about 11 million children eating plate lunches at school—both in and outside of the national School Lunch Program. Our progress, thus far, has taken us about half way. We must also remember, however, that by 1965, an additional 10 million children will be enrolled. Our planning must take these children into account. Thus, the job ahead is considerably bigger than the job that has already been accomplished.

Planning for the Future

Certainly, there is a job ahead to increase student participation in the school lunch program. Making a complete plate lunch available is the first step. But, should we not give even greater attention to assure that more of the children who have the plate lunch available actually eat that lunch?

Part of this problem of non-participation will be solved by improving school lunch operations in the individual schools. Here we must look to the supervision and assistance available to the local school lunch managers. As we look at the size of the job ahead, we can certainly see the need for more personnel trained in school lunch management.

An equally important part of planning for the future is an appraisal of the tools themselves. Are they adequate for the job? We agree the time has come when the tools of the school lunch program should be reappraised. I should like to throw out for your consideration some of the things that might well be considered.

Certainly, with the probable future demands for school food services, we should look at the sources now available to finance the growth in the program.

Last year, the federal contribution to the school lunch program—in cash and in commodities, and exclusive of the special milk program—was about $230 million. I think it is significant that, in 1957, when the school lunch appropriation was increased to $100 million, it reached the maximum level discussed at the time the Act was passed. The bill, as passed by the House, limited the maximum annual expenditure to $50 million; the Senate version authorized a maximum of $100 million. In the Conference Committee, agreement was reached to eliminate any reference to a specific maximum.

It is clear from the legislative history of the Act that the Congress intended the states to assume financial responsibility for the program. But it also indicated that there should be a broad base for this responsibility, because the Act's matching provisions refer to funds from all sources within the states. Children's payments have been by far the largest source of state and local income to the program. Will this pattern be adequate for the future? If not, is there a need to find a more positive incentive for drawing more state and local government funds into the program?

We might also review the rules under which the available federal funds are expended. For example, the Act endeavors to equalize school lunch opportunities within the various states by providing relatively more assistance to the lower income states. However, because the rate of program growth has varied in the several states, we find serious distortions in the actual application of this principle as measured by per-meal rates of assistance. We have some of the higher average reimbursement rates in the higher income states and some of the low rates in the lower income states. Does this limit the over-all effectiveness of the federal assistance program? There is also the problem of distributing federal grant funds between schools within the states. Can better formulas or arrangements be worked out for allocating more funds to those areas or schools which are most in need, less to those that are better off?

What about the over-all school lunch responsibilities of state education agencies? Can the state educational agency provide broad leadership if its authority to obtain sound operating standards is limited to only those schools that receive federal cash assistance? In fact, I assume that, with special milk and surplus commodities going to many schools not now in the school lunch program, some school people are already finding themselves with some food service responsibilities in almost every school which offers its children any food.

There are certainly no ready answers to such questions, but there is a need for us to start to explore some of these areas as part of our long-range planning.

Special Milk Program

Let us turn now to the Special Milk Program. Here, as in the School Lunch Program, I feel we—the Department and the states—have a tremendous record of accomplishment—and in a relatively short time, especially when we remember that this is a temporary program first authorized for the school years 1954-55 and 1955-56, then extended to cover 1956-57 and 1957-58.

I would be concerned if this progress under the milk program had been gained through a lessening

of the emphasis on the need to expand the school lunch program. We do not believe that has been the case. In fact, the milk program is benefiting children that the School Lunch Program does not reach, including many whom it simply could not reach because of the absence of lunch facilities. We have 6½ million children in public schools where there is no lunch program. These schools do have the opportunity to provide milk.

We are also reaching many of the 15 million children who do not eat the plate lunch in schools where food service facilities are available. They are encouraged to drink milk with their noonday meal or, if they do not patronize the lunchroom, many of them have an opportunity to buy milk at other times during the school day.

And our school lunch children are benefiting, too.

When the program was modified after the first year's operation, we went as far as we could toward making it possible for the local school to integrate its milk service into its total lunch program. It was possible also for the school to establish a pricing policy that would effectively stimulate sales.

These two things, plus much good work on the part of the state people, have accounted for the growth and the success of the Milk Program. Under the School Lunch and Special Milk Programs, children consumed almost 3.6 billion half-pints of milk in the last school year.

I know there has been considerable support for the merging of the School Lunch and School Milk Programs among state school lunch directors. I understand that this support, in part, stems from the belief that such a merging would provide increased assistance for the service of milk under the School Lunch Program. However, the school milk authorization would not be a source of funds for school lunch expansion, even if it were a permanent program unless we were willing to forego some of the results we are now obtaining under the Milk Program. I do not believe the Department could support or defend such an action. Clearly, it seems to me, the problem of school lunch financing must be faced within the School Lunch Program.

Reference

(1) MARKET DEVELOPMENT BRANCH, AGRICULTURAL MARKETING SERV.: Participation of Schools and Pupils in the School Lunch and Special Milk Programs in March 1957. A Preliminary Report. U.S.D.A. AMS-206, August 1957.

Radioactivity of Milk

A year-long pilot study has shown that the radioactivity in all milk examined was well below the permissible limit agreed on by the National Committee on Radiation Protection and Measurement.

The study was conducted by the Public Health Service in five areas—the milk sheds serving Sacramento, Salt Lake City, St. Louis, Cincinnati, and New York City. To make these studies, a monthly 1-gal. sample was collected at a designated point in each of the five milk sheds. Samples were analyzed for specific radiisotopes. Because variations in radioactivity in samples taken at different times in the same area suggest that seasonal factors or variations in dairying methods may influence the concentration of radioactive substances in milk, it was estimated that sampling and analysis over a period of a year would be required to determine the radioactive levels and to obtain comparisons between areas.

The maximum permissible concentration of strontium-90 is about 80 micromicrocuries per liter of milk. (A curie is a measure of radioactivity equivalent to that produced by 1 gm. radium. A micromicrocurie is one-millionth of a millionth of a curie.) Values found in this study ranged from 3.4 to 7.5 micromicrocuries per liter, or a range of from 5 to less than 10 per cent of the maximum permissible concentration for regular consumption.

Other radioactive elements found were also well below maximum permission concentrations. The levels of barium-140 ranged from 19.5 to 98.5 compared with the maximum permissible limit of 200,000. Levels of cesium-137 ranged from 27.5 to 43.7 compared with the maximum permissible limit of 50,000.

This pilot study is part of the Public Health Service's broad program of environmental analysis which includes amounts of radioactivity in water, air, and food. Milk was chosen for the initial study of foods since it is among the most important foods and because it is produced throughout the year in all sections of the country. The Public Health Service is continuing the analysis of milk and is expanding the areas covered. Additional sampling points are being established in the milk sheds serving Atlanta; Fargo, North Dakota and Moorhead, Minnesota; Austin, Texas; Spokane, Washington; and southern Wisconsin.

III. A Vegetable Acceptance Study

Plate Waste in a School Lunch[1]

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IN EARLIER reports (1, 2), the amounts and sources of plate waste in the lunchroom of an Ohio school were presented. Vegetables contributed a larger percentage to the total waste than either protein-rich foods or desserts, including fruits. An educational program designed to reduce plate waste and increase the acceptance of vegetables by the children is reported here.

In order to develop an effective program of this kind, as much background information as possible was obtained about the food habits of the children and their parents. The food intake of an individual varies from day to day and observations for short periods can only be used as estimates of existing food habits. Further, the family food supply may be adequate, but each member may not share in accordance with his needs.

Procedure

In the autumn of 1954 a survey was conducted among twenty-eight fourth grade students in an Ohio school to determine their acquaintance with and preference for fifteen green and yellow vegetables (3). In this study a list was provided on which the children checked one of the following for each vegetable: *like very much, don't like,* or *have never tasted.*

In home interviews, parents of these children provided information on family practices in buying, prepairing, and serving the fifteen vegetables. They were asked to indicate how often the vegetables were served (often, rarely, or never), whether they were liked by the parents, and the usual method of preparation.

Three of the vegetables with which the children were least familiar—broccoli, rutabaga, and squash —were subsequently served to the children at tasting parties to acquaint them with these foods gradually and to measure acceptance when this method was used. Broccoli was served buttered at three tasting parties; squash was mashed and also as buttered cubes, three times each; and rutabaga was served three times—in mashed form twice and as buttered cubes once. The children were asked to indicate whether they liked the vegetable by writing *yes* or *no* on a slip of paper.

Following the tasting parties, each vegetable was incorporated in a different Type A school lunch menu and each menu was repeated three times at about ten-day intervals. Served with the buttered broccoli each time were scalloped potatoes, baked ham, bread and butter, peach half, and milk. Squash (in mashed form twice and in buttered cubes once) was offered with chicken sandwich, green beans, cranberries, Graham cracker pudding, and milk. The menu served with rutabaga included weiner sandwich, baked potato, fresh fruit, and milk. The rutabaga was offered raw, buttered, and mashed once each.

The investigator recorded the children's reactions to the featured vegetable. If the child ate all of a 50-gm. serving or more, this was interpreted as a liking for the item.

Several methods of stimulating student interest in the project were used. For example, as each new vegetable was presented at tasting parties, it was shown in its natural form and the children were told what part of the plant it represented. The students were given opportunities to read about the vegetables in the classroom, and some brought samples of broccoli and squash from home. These were cooked, and the class tasted them. The children were also provided opportunities to suggest more appealing ways of preparing and serving the vegetables.

When the study with the children was completed, a questionnaire was sent to the parents to learn the effect of the activities at school on the use of these vegetables at home.

In the spring of 1956, the vegetable preference study was repeated among twenty-six of the original twenty-eight children. A comparison of results of these two studies will be presented here.

[1]Contribution No. 23, Subproject 2, of the North Central Regional Cooperative Project NC-5, Nutritional Status and Dietary Needs of Population Groups. Ohio Agricultural Experiment Station, Wooster, Journal article No. 88-57, Project No. Hatch 61. Received for publication December 23, 1957.

Results and Discussion

FIRST ACCEPTANCE STUDY

Comparisons of information obtained in home interviews with that from the children's initial check lists revealed that the vegetables liked by the majority of the parents were the same as those liked by their children. These vegetables were also those most frequently served at home and with which the children were most familiar. That children usually associated likes and dislikes for certain vegetables with certain methods of preparation was revealed during the study.

The vegetables with which the children were least familiar were asparagus, beet greens, broccoli, Brussels sprouts, rutabaga, squash, and wax beans (Table 1). Twenty-three of the twenty-eight children were unfamiliar with broccoli, while five indicated on the check list that they liked it very much. After tasting this vegetable in small amounts at three tasting parties, twenty-six of the twenty-eight children indicated a liking for it. Buttered broccoli was served in the school lunch on three occasions following the tasting parties and was accepted in varying degrees, but on the final observation all twenty-eight children ate all that was served to them.

Rutabaga was an unfamiliar vegetable to twenty-five of the children, and only two stated a liking for it on the initial check list. After three tasting parties, twenty-five liked raw cubes. Cooked mashed rutabaga was served at two tasting parties; only two liked it at the first taste, but twenty-one liked it the second time. Buttered cubes served at one tasting party were liked by twenty-one of the children. When acceptance of this vegetable was observed in three subsequent school lunches with the same menu each time, all twenty-eight children liked raw cubes, seventeen liked it cooked and buttered, and nineteen liked it mashed.

TABLE 1 Acceptance of fifteen vegetables by twenty-eight children in 1954 and by twenty-six of the same children in 1956

VEGETABLE	HAVE NEVER TASTED		LIKE VERY MUCH		DON'T LIKE	
	1954	1956	1954	1956	1954	1956
	%	%	%	%	%	%
Asparagus	61	27	18	46	21	27
Beet greens	89	81	11	8	0	12
Broccoli	82	4	18	81	0	15
Brussels sprouts	75	58	21	35	4	8
Cabbage	4	0	96	88	0	12
Peas	0	0	82	81	18	19
Lettuce	4	0	96	81	0	15
Green beans	0	0	100	88	0	12
Spinach	0	0	61	58	39	42
Carrots	0	0	100	96	0	4
Corn	0	0	96	92	4	8
Rutabaga	89	12	7	65	4	23
Squash	54	4	29	35	18	62
Sweet potatoes	7	4	71	46	21	50
Wax beans	54	19	39	54	7	27

Fifteen of the children had never eaten squash. Mashed squash was tasted with varying reactions during the three tasting parties. Fourteen children indicated a liking for the mashed squash at the first tasting party, seven at the second, and eight at the third; only four children liked it all three times. On the other hand, cooked buttered cubes of squash were liked by eight children at the first tasting, by ten at the second, and by seventeen at the third; again, only four children liked it all three times. Acceptance of mashed squash was observed twice in subsequent school lunches; thirteen ate all of the portion served them during the first observation and sixteen the second time. Eighteen of the twenty-eight students liked the squash served as buttered cubes in the school lunch.

Familiarity was apparently the most important factor in acceptance of broccoli, rutabaga, and squash—the three vegetables sampled at tasting parties. For example, of the twenty-three children who had never tasted broccoli at the beginning of the study, parents of seventeen had never served this vegetable at home. However, twenty-two of the twenty-three said they liked broccoli at the close of the study. Rutabaga had never been tasted by twenty-five of the children before this study and twenty-three of the parents had never served it at home; however, on the final check list twenty-four of the twenty-five indicated that they liked it. Fifteen children had never before tasted squash, eleven of their parents never having offered it at home, but only six of these children liked squash at the close of the study.

The final check list of vegetable likes and dislikes of the children was compared with that of their parents. Twenty-seven children liked rutabaga, but only five parents liked it and ten disliked this vegetable. Fourteen children liked squash, whereas one or both parents of eight of these children liked it. Fourteen of the children disliked squash, and one or both parents of seven disliked it. At the end of the study, only one child disliked broccoli, but parents of twelve children did not like it.

Information supplied by parents by letters at the close of the study indicated that eleven pupils had requested that broccoli be served at home and eleven parents reported serving the vegetable. Eight children had asked for rutabaga for home meals, and five parents had complied. Squash had been requested by five children, and nine parents reported that they served it.

The following conclusions were drawn from this study of vegetable acceptance:

(a) Most of the children liked vegetables they had eaten previously, and an over-all increase in

acceptance of broccoli, rutabaga, and squash occurred during the study.

(b) Responses to a specific vegetable varied from time to time.

(c) Acceptance of rutabaga, squash, and broccoli by parents was apparently not a determining factor in the children's reactions when they were given several opportunities to taste these vegetables at school.

(d) Children's likes and dislikes for certain vegetables were associated with certain methods of preparation.

RESURVEY OF VEGETABLE ACCEPTANCE.

In the spring of 1956, twenty-six of the original twenty-eight children who participated in the study of vegetable preferences again indicated on the check list their preferences for the same fifteen vegetables (Table 1). For all vegetables, fewer children indicated *have never tasted*. Familiarity of a larger percentage of children with certain vegetables in 1956 as compared with 1954 can be attributed in part to the previous tasting parties and to some extent to a greater variety of vegetables served in the school lunch and at home.

None of the children had indicated a dislike for cabbage, lettuce, or green beans in 1954, but in the resurvey a year later, more than 10 per cent did. In every case, the percentage of children disliking certain vegetables increased in 1956. The increase was largest for squash, sweet potatoes, rutabaga, and wax beans. As previously mentioned, in the 1956 observation more children were familiar with the vegetables. Hence, not only was the number *liking very much* increased for some vegetables, but also the number of those *not liking* certain vegetables was larger.

Preferences of subjects in 1956, for twelve familiar vegetables compared with the actual eating performance when these vegetables were offered in the school lunch are presented in Table 2. All of the children who indicated a liking for cabbage, green beans, and wax beans ate them. All of the vegetables except broccoli, Brussels sprouts, green beans, and corn with green beans were eaten in the school lunch by at least some of the children who had indicated a dislike for them on the check list. Neither peas with carrots nor corn with green beans were listed on the original survey check lists. For these two vegetable mixtures, figures were used for children liking peas and liking corn, respectively, in the 1956 resurvey. Indications are (Table 2) that corn and green beans were better accepted alone than when combined and that peas with carrots were better accepted together than when either was served separately. All but one of the four vegetables checked as *have never tasted* by some of the children were eaten by at least some of them.

TABLE 2 Eating performance of children compared with stated likes and dislikes

VEGETABLE	CHILDREN	HAVE NEVER TASTED		LIKE VERY MUCH		DO NOT LIKE	
		Survey	Actually ate	Survey	Actually ate	Survey	Actually ate
		%	%	%	%	%	%
Broccoli	23	4	4	78	74	17	0
Brussels sprouts	26	58	23	35	31	8	0
Cabbage	21	0	0	86	86	14	14
Peas	19	0	0	89	79	11	5
Lettuce	25	0	0	88	76	12	8
Green beans	23	0	0	91	91	9	0
Spinach	20	0	0	50	40	50	20
Carrots	26	0	0	96	88	4	4
Corn with green beans	24	—	—	96*	58	4*	0
Sweet potatoes	23	4	0	43	39	52	22
Wax beans	23	17	17	57	57	26	22
Peas with carrots	23	—	—	87†	87	13†	9

*Corn only.
†Peas only.

PLATE WASTE DURING ACCEPTANCE STUDIES

Mean percentages of plate waste in the school lunch per child by grade for three periods in 1954-55 and again in 1955-56 are shown in Table 3. During the second year, as described in an earlier paper (2), a program for improving the nutrition of the children was in progress. Among other things, some green and yellow vegetables with which most of the children were not familiar were introduced into the school lunch. Information presented for Period I was obtained in the fall; for Period II, during the early winter; and for Period III, in the spring. In both school years, the lowest percentages of plate waste occurred in the third period for all grades except the sixth and seventh in 1954-55 and the fifth in 1955-56.

Percentages of returned food were consistently higher for the first grade than for any other grade (Table 3). During the second year of the study, when the former first graders had advanced to the second grade, percentages of plate waste for the

TABLE 3 Average plate waste per child during year of vegetable acceptance study and the following year

GRADE	AVERAGE PLATE WASTE							
	Period I		Period II		Period III		Over-all average	
	1954-55	1955-56	1954-55	1955-56	1954-55	1955-56	1954-55	1955-56
	%	%	%	%	%	%	%	%
1	12.5	10.5	12.2	15.9	8.6	7.1	11.1	11.4
2	7.3	9.2	7.1	10.0	6.5	5.8	7.0	8.7
3	8.7	9.6	8.3	7.7	7.9	4.0	8.3	7.9
4	3.1	3.6	3.1	3.0	2.6	2.8	2.9	3.2
5	8.8	3.6	8.0	6.7	7.2	4.3	8.0	4.7
6	4.7	8.5	2.6	8.5	3.7	3.8	3.7	7.5
7	3.8	6.2	3.7	4.7	3.7	3.0	3.7	5.1
8	7.5	8.9	6.4	8.2	6.3	5.6	6.7	8.0
All	7.0	7.5	6.4	8.1	5.8	4.6	6.4	7.2

group dropped substantially. This decrease may have been due in part to their adjustment to school and to the lunchroom routine.

Percentages of plate waste did not differ greatly between the second and third grades nor between the sixth and seventh grades. At the fourth grade level in both years, however, percentages of waste were lower than for any other grade for all periods except the sixth grade in Period II of the first year. During the first year of the study, vegetable tasting parties and other special attention were given the fourth grade children. Because of this, these children may have been more interested in the food and less prone to waste. On the other hand, the fourth grade during the second year of the study received no special attention but wasted just as little food as their predecessors.

The fourth grade children who had been promoted to the fifth grade for the second year of this study contiued with a low percentage of waste for the first period of the second year, but during Periods II and III, percentages of waste increased. However, these values were lower than for the preceding fifth grade.

Children in the fifth grade in 1954-55 had the largest percentages of plate waste among the five upper grades (4 through 8). When these children were in the sixth grade, the pattern of high plate waste continued for Periods I and II, but in Period III the percentage dropped almost to the level of the other four grades.

In general, lower percentages of food were returned among the upper grades, particularly for the fourth, sixth, and seventh, than among the first three grades. The mean percentages of plate waste for all grades for all periods were higher for the second than for the first year of the study except for the third and fifth grades. These higher percentages of plate waste in the second year may have been due in part to the increased use and larger servings of green and yellow vegetables, some unfamiliar.

Summary

In a program designed to improve vegetable acceptance among fourth grade students participating in the school lunch, the children ate best the vegetables with which they were most familiar and which had been served regularly at home. When vegetables relatively new to the children were served at tasting parties and subsequently in the school lunch, responses were variable but, in general, acceptance tended to improve with familiarity. In a resurvey of vegetable preferences after one year, the degree of acceptance built up in the vegetable acceptance improvement program for certain previously unfamiliar vegetables was fairly well maintained.

Observations of plate waste in the total lunch program of the school in the two years revealed that in general the largest percentages of waste occurred in the fall (Period I) and the lowest, in the spring (Period III) for most grades. Mean percentages of plate waste were highest for the first grade and least for the fourth grade in both years. The comparatively low percentages of food returned in the fourth grade in the first year may have been due to some extent to participation in the vegetable tasting parties. This relatively low waste tended to be carried over with them into the first period of the fifth grade. Mean percentages of plaste waste for the upper grades tended to be lower than for the primary grades.

For most grade levels in Periods I and II, the percentages of plate waste were higher during the second year than in the first. In Period III, however, the percentages were lower in the second year for all but three grades—the first, fourth, and sixth. However, for two of these grades, the fourth and sixth, the percentages were only slightly higher in the second year.

Food acceptance improvement programs, such as tasting parties, can serve a twofold purpose; first, in increasing the variety of foods familiar to the children and second, in increasing the nutritional benefits derived by children from the school lunch by stimulating their interest in food and cultivating better attitudes toward it. Children in the present study tended to slip back into a pattern of higher plate waste when the educational efforts were relaxed.

References

(1) CARVER, A. F., AND PATTON, M. B.: Plate waste in a school lunch. 1. Over-all waste. J. Am. Dietet. A. 34: 615, 1958.

(2) PATTON, M. B., CARVER, A. F., AND HUNT, F. E.: Plate waste in a school lunch. 2. Sources of waste. J. Am. Dietet. A. 34: 733, 1958.

(3) MILLER, B. J.: Acceptance of three vegetables by 28 Ohio fourth grade children. Unpublished waste. J. Am. Dietet. A. 34: 733, 1958.

Use of Hospitals in the U.S.

During the last two decades, the proportion of the American population admitted to hospitals has more than doubled, according to Health Information Foundation. However, the average stay per person has declined by almost half —from 41.1 days per person in 1935 to 22.4 days in 1956.

Men require more hospital treatment than women, even though women's admission rates are much higher during the child-bearing years. Rural residents are admitted to hospitals more often than urban residents, but city dwellers generally require a longer stay.

II. Animal Experimental Research

Diet and Atherosclerotic Disease[1]

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EXPERIMENTAL ATHEROSCLEROSIS has a history and a pre-history. The dividing line is roughly the year 1910. Until then, every effort to reproduce atherosclerosis in laboratory animals had met with failure. Different types of vascular scleroses had been produced by a variety of means, but never atherosclerosis (1). In 1908-12, success was first achieved in producing atherosclerosis by feeding rabbits animal tissues. It was soon shown that the lipids (cholesterol and other fatty materials) in these tissues—and not the proteins—were the decisive atherogenic factors. Thus, hypercholesterolemia and atherosclerosis were readily induced simply by adding cholesterol and oil to vegetarian rabbit chow.

Production of Atherosclerosis in Different Species

In the last decade, hypercholesterolemia and atherosclerosis have been induced by dietary means in all the major laboratory species—herbivorous, omnivorous, and carnivorous. In the chick, like the rabbit, this was achieved by feeding a diet supplemented with cholesterol and oil. With addition of 0.5 to 2.0 per cent cholesterol and 5 to 10 per cent fat, marked tissue cholesterosis, and extensive arterial plaques develop in one to three months. In these two susceptible species, atherosclerosis was also induced without massive hypercholesterolemia or organ lipidosis, by feeding relatively small amounts of cholesterol and fat for relatively long periods (nine or more months).

In species more resistant than the chick and the rabbit, hypercholesterolemia and atherosclerosis were induced by resorting to more complex methods. Thus, the prerequisite nutritional-metabolic alteration was effected in dogs by feeding a high-cholesterol, high-fat diet combined with hypothyroidism; in the monkey and the rat, feeding a high-cholesterol, high-fat diet deficient in the sulfhydril-containing amino acid, methionine. More recently hypercholesterolemia and atherosclerosis were produced in monkeys and rats with high-fat, high-cholesterol diets alone. Moreover, coronary thrombosis and myocardial infarction in rats—and cholesterol diets alone. Moreover, coronary thrombosis, and dissecting aneurysm in aortas of chicks —were also recently induced by dietary-metabolic means. These experimental achievements apparently represent approaching solutions to long-standing problems confronting experimental atherosclerosis, that is, the reproduction in animals of all aspects and complications of the human disease.

In viewing this research development in perspective, it is essential to appreciate the common thread running through all these achievements. *Invariably the* sine qua non *for experimental atherogenesis in all species has been a nutritional alteration, the critical change being to a high-fat, high-cholesterol intake, maintained over a sustained period and leading to a hypercholesterolemic hyperlipemia.*

Some partial exceptions to these generalizations have emerged from recent studies. Moderate hypercholesterolemia and atherosclerosis have been produced under special circumstances in animals on a cholesterol-free diet, e.g., in hibernators (ground squirrels) after three to eighteen months on an *ad lib* fattening diet high in vegetable lipids from peanuts; in geese after three months on a force-fed, high-carbohydrate fattening regimen (a diet rendered far more atherogenic by the addition of cholesterol); in rabbits after twelve months on an *ad lib* diet high in vegetable fat from peanuts; in rabbits after 100 days on a purified ration containing 20 per cent hydrogenated coconut oil (a highly saturated fat).

These data suggest that hypercholesterolemia and atherogenesis may be induced—to a limited extent and in some species, at least, and after a relatively long time—by excessive intake of calories *per se*, even when derived from carbohydrates and/or un-

[1]Based on talks given before the Chicago Nutrition Association on May 29, 1957, and at the 40th Annual Meeting of The American Dietetic Association in Miami, on October 22, 1957.

[2]Established Investigator of the American Heart Association, 1952-58; as of April 1, 1958, Director, Heart Disease Control Program, Chicago Board of Health. For acknowledgements, see Part I of this series.

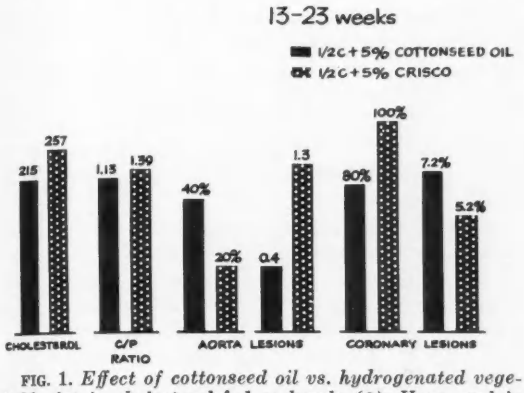

FIG. 1. *Effect of cottonseed oil vs. hydrogenated vegetable fat in cholesterol-fed cockerels (2). Here, and in subsequent graphs, pairs of bars are scaled separately. The first pairs of bars relating to aorta and to coronary lesions refer to incidence of lesions, i.e., per cent of birds with lesions (40 and 20 per cent, 80 and 100 per cent) in the thoracic aorta and coronary arterial systems respectively. The aorta lesions were evaluated on gross specimens; the coronary, on microscopic sections. The second set of bars dealing with aorta lesions is an index of severity, i.e., the mean grade of lesions in birds with lesions, graded on an abritrary scale of zero to 4 (1). The second set of bars dealing with coronary lesions is based on an index of severity, i.e., the mean per cent of vessels exhibiting plaques among all vessels visualized in two representative sections per bird.*

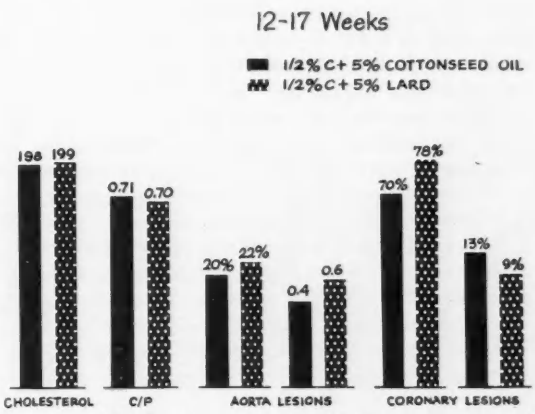

FIG. 2. *Effect of saturated animal vs. unsaturated vegetable fat in cholesterol-fed cockerels (2). See caption for Figure 1 for explanation of scales used.*

saturated vegetable oils, without cholesterol or animal fat. They further suggest that highly saturated fat without cholesterol may induce hypercholesterolemia and atherogenesis, in rabbits at least, even without concomitant development of obesity. Finally, they support the significant conclusion that *prolonged ingestion of diets combining excess of cholesterol, lipids, saturated lipids, and calories may be especially pernicious in their hypercholesterolemia-inducing and atherogenic effects.*

The diets of broad strata of the American population today are of this composition. It would seem likely that conclusions based on findings in several laboratory species—rabbit, chick, goose, parrot, rat, dog, monkey, guinea pig, hamster, pig, and squirrel —are not without their applicability and validity for man.

Another major contribution of experimental atherosclerosis has been the demonstration that the pathologic plaque is, within limits, a reversible lesion. This has been shown in rabbits, chicks, and dogs. Experiments on this aspect of the problem involved the production of lesions by feeding an atherogenic diet. When this diet was discontinued and a low-fat, low-cholesterol ration substituted, hypercholesterolemia and atherosclerosis (both aortic and coronary artery) underwent gradual regression. It has also been shown that estrogens reverse diet-induced plaques in the coronary vessels of chicks, even when the atherogenic diet is continued during the period of hormone treatment.

Animal Studies on Unsaturated Fatty Acids

Recent work on the effects of unsaturated vegetable oils on cholesterolemia in man has led to exploration of this problem in experimental animals. Before considering the newer findings, it is worth noting that for decades experimental atherosclerosis was routinely produced—originally in rabbits and later in chicks and other animals—by feeding diets containing cholesterol and unsaturated vegetable oils. In apparent contradiction to the positive findings of some recent supplementation studies in man, incorporation of large amounts of unsaturated vegetable oils in the high-cholesterol diets of experimental animals did not inhibit hypercholesterolemia or atherogenesis. In fact, it is an old observation in rabbits and chicks that ingestion of mash supplemented with cholesterol plus vegetable oil resulted in more marked hypercholesterolemia than feeding mash plus cholesterol alone. Further, as already noted, rations high in unsaturated vegetable fats, e.g., from peanuts, may induce hypercholesterolemia and atherogenesis in rabbits and squirrels in the absence of dietary cholesterol. Moreover, feeding mash plus 20 per cent cottonseed oil alone (without cholesterol) apparently induced slight hypercholesterolemia. Again, these results are in apparent contradiction to those in man.

Recent experiments have further shown that feeding chicks mashes supplemented with varying lipids at the 5 to 10 per cent level, e.g., relatively saturated lard, coconut oil, or hydrogenated vegetable fat vs. unsaturated oils (linseed, cottonseed, corn oil), yielded little or no difference in hypercholesterolemia and atherogenesis (Figs. 1 and 2) (2).

On the other hand, in a similar experiment comparing an oleic acid concentrate and cottonseed oil in cholesterol-fed cockerels, atherogenesis was less marked (although hypercholesterolemia was un-

affected) in the birds ingesting large amounts of oleic acid. In contrast, other investigators studying rats fed cholic acid, cholesterol, and various fats, collected data indicating that hypercholesterolemia was most marked with monounsaturated oleic acid. Both saturated and polyunsaturated fats tended to suppress hypercholesterolemia in proportion to the product of their amounts in the diet. In experiments with rabbits, other workers observed that long-term ingestion of highly saturated coconut oil (without cholesterol) induced hypercholesterolemia and atherosclerosis, whereas a ration high in unsaturated safflower oil apparently had no such effects. These experiments are among the few in animals showing any clear-cut differences with different fats.

In calling attention to the apparently divergent results of experiments with unsaturated vegetable oils in man vs. chick, rabbit, and rat, it is essential to note the difference in experimental design. Except for a few of the human studies, the subjects investigated were persons on American-type, high-calorie, high-fat, high-saturated-fat diets. Concomitantly, they manifested moderate or marked hypercholesterolemia. Most of the positive studies in such people were of the substitution type (complete or partial), involving withdrawal of saturated fat and cholesterol and incorporation of unsaturated vegetable oil.

These investigations were patently not analagous to the animal experiments. The latter generally involved the addition of unsaturated vegetable oil and large amounts of cholesterol to the low-fat, low-cholesterol rations of rabbits and chicks exhibiting low-normal serum cholesterol levels. Experiments in rats also involved administration of cholic acid.

It would appear that further animal experiments are essential, utilizing a design similar to the human studies. Until these are accomplished, it would be premature to attribute the seemingly contradictory findings in animals and man to "species differences." In any case, should species differences actually be demonstrated, their mechanism becomes an important problem *per se* (1).

Deficiency of Essential Fatty Acids

At this juncture it is appropriate to deal with animal experimental evidence bearing on this problem. Obviously, from the foregoing experiments, atherosclerosis can be readily produced in chicks and rabbits by cholesterol feeding—even in the presence of large amounts of the essential fatty acids, that is, the polyunsaturated vegetable oils. In fact, their presence in the diet was associated with enhanced hypercholesterolemia and atherogenesis. These findings were confirmed by additional experiments using large amounts of a linoleic acid (an essential fatty acid) concentrate in cholesterol-fed cockerels.

Moreover, other workers have shown that cholesterol-fed cockerels have normal levels of essential fatty acids in their tissues. They do not manifest measurable signs of any deficiency of essential fatty acids. All these experimental facts cast serious doubt on the speculation that atherogenesis is a lesion resulting from a deficiency of essential fatty acids.

Here it is important to recall the experimental conditions required for the production of true deficiency of essential fatty acids in animals. As the original work over two decades ago demonstrated, signs of essential fatty acid deficiency can be elicited only by accomplishing virtually complete removal of all dietary fat. The incorporation of only slight amounts of any fat (animal or vegetable) in the experimental ration rendered impossible the production of signs of essential fatty acid deficiency.

Recently it was shown that this deficiency is more readily and rapidly produced when a diet rigidly devoid of lipid was combined with other nutritional-metabolic abnormalities, e.g., high-cholesterol intake, induced diabetes mellitus, or other stresses. These findings suggested that need for the essential fatty acids may be a function of the over-all nutritional-metabolic situation of the organism. Moreover, they support the conclusion, already presented, that if a deficiency of essential fatty acids does develop in man with the ingestion of diets high in calories, fats, saturated-fats, cholesterol (an unlikely possibility), then it can only be a relative, secondary, derivative deficiency of dietary imbalance.

Dietary Interrelationships and Cholesterolemia and Atherogenesis

Another highly significant development in animal experimental research has been the study of the interrelated effects among cholesterol-lipid and other nutrients. One special facet of this research involves the effects of special supplements, e.g., plant sterols, brain extracts, corn germ, to a high-cholesterol, high-fat ration. Each of these has been shown to produce a significant inhibition of hypercholesterolemia and atherogenesis. These experiments do not bear directly on the problem of the influence of the main constituents of the usual diet on cholesterolemia and atherogenesis. Nevertheless, they offer possible approaches to the therapy of these conditions in man (3).

Further, as already noted, it was shown that atherosclerosis could be successfully produced in monkeys and rats with a ration high in cholesterol-lipid and inadequate in methionine. This phenomenon was amply confirmed in experiments in chicks. Other studies demonstrated that a low-choline ration also aggravated the hypercholesterolemic and atherogenic effects of a high-cholesterol, high-fat diet in

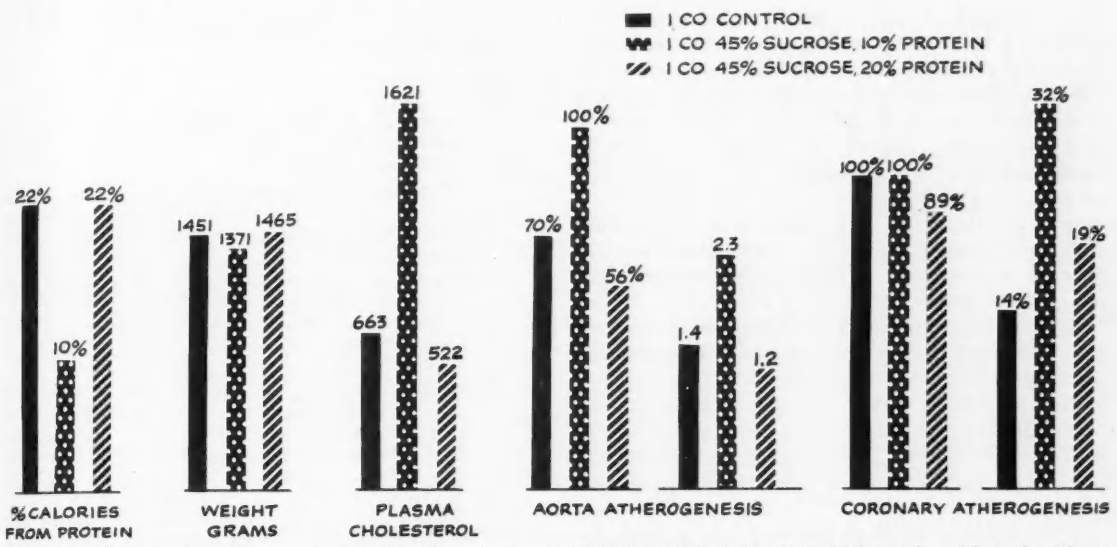

FIG. 3 *Effect of the addition of refined carbohydrates to high-fat, high-cholesterol chick mash, with and without reduction in dietary protein (4). See caption for Figure 1 for explanation of scales used.*

rats. In contrast to these findings with deficiency of methionine and choline, experiments in recent years have tended generally to confirm previous extensive observations that supplementation of a nutritionally adequate ration with methionine, choline, or other lipotropic factors fails to suppress hypercholesterolemia and atherogenesis (1).

Other recent experiments have further shown that hypercholesterolemia and atherogenesis were aggravated in cholesterol-oil-fed chicks ingesting a diet low in total protein. For example, it was demonstrated that hypercholesterolemia and atherogenesis were apparently aggravated in cholesterol-oil-fed chicks permitted to ingest only 60 per cent of their usual total feed intake, or subjected to intermittent starvation. Hypocholesterolemia and atherogenesis were also found to be markedly increased in cockerels ingesting a high-fat, high-cholesterol ration in which protein was reduced to 10 per cent by adding 45 per cent sucrose to the mash. (Fig. 3) (4). In addition, it is plain that supplementation with soy protein (restoring the dietary protein to 20 per cent) prevented the deleterious effects of the 45 per cent sucrose. It was also demonstrated that protein supplements (casein and egg albumen) partially counteracted the hypercholesterolemia and atherogenesis developing in cockerels on mashes containing butter, cholesterol, and egg yolk respectively (Fig. 4) (5). In accordance with other findings (Figs. 1 and 2), hypercholesterolemia and atherogenesis were no more severe in birds fed relatively saturated fats of animal origin (butter, egg yolk) than in chicks given cottonseed oil. One recent clinical study found that serum cholesterol levels of human subjects on a 65- to 70-gm.-fat diet failed to

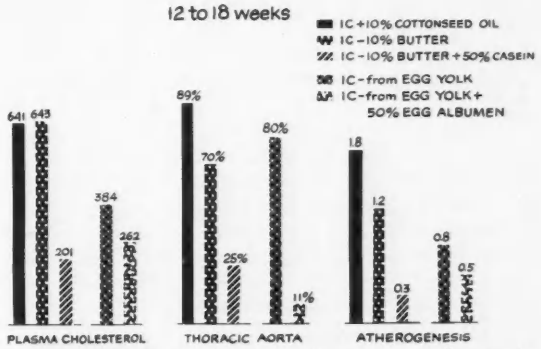

FIG. 4. *Effect of adding casein and egg albumen to mashes containing butter plus cholesterol, and egg yolk respectively (5).*

change significantly in response to variations in the level of protein intake.

In addition to the foregoing experiments on nutritional interrelationships. the last year or two has witnessed the development of studies on the effects of trace minerals in animals on a high-fat, high-cholesterol diet.. Thus, evidence was obtained indicating that vanadium, cobalt, and magnesium may inhibit hypercholesterolemia and atherogenesis. Work along similar lines is proceeding on the intertwined effects among specific carbohydrates, vitamins, lipids, and cholesterol, and recent studies indicate that dietary carbohydrate and fat interdependently influence levels of serum cholesterol-lipid-lipoproteins in man.

It should be emphasized that all these experiments on nutritional interrelationships involve analyses of the effects of specific nutrients (amino acids, lipo-

tropic factors, proteins, vitamins, carbohydrates, minerals) in animals on high-fat, high-cholesterol diets. By demonstrating significant influences of some of these nutrients, e.g., proteins, these experiments lend support to the concept that the over-all patterns of the diet—and nutritional imbalance—play a key role in the causation of hypercholesterolemia and atherogenesis. At the same time, their results reinforce the basic theoretical concept that high-lipid intake is the decisive nutritional aberration in the etiology of hypercholesterolemia and atherogenesis.

In thus summing up the significance of the findings of animal experimental research, it is perhaps relevant to note again the seemingly paradoxical results of studies with unsaturated oils in animals and man. The problem of fat quality—of the effects of different types of fat—remains to be definitely elucidated in relation to experimental atherosclerosis.

It should also be re-emphasized that animal experimental research—like clinico-pathologic and epidemiologic investigation—has also accumulated extensive data on the interlocking among dietary and other factors, e.g., hormonal, in the regulation of cholesterolemia and atherogenesis. A detailed account of this area of experimental work is beyond the scope of this report but has been discussed in other papers (1, 3, 6).

References

(1) KATZ, L. N., AND STAMLER, J.: Experimental Atherosclerosis. Springfield, Ill.: Charles C Thomas, 1953.

(2) STAMLER, J., PICK, R., AND KATZ, L. N.: Effects of various fats on cholesterolemia and atherogenesis in cholesterol-fed cockerels. Fed. Proc. 16: 123, 1957.

(3) STAMLER, J.: Status of current approaches to the definitive therapy of atherosclerotic disease. Proc. Second Conf. on Cerebral Vascular Diseases, January, 1957. N.Y.: Grune and Stratton, in press.

(4) STAMLER, J., PICK, R., AND KATZ, L. N.,: Effects of dietary protein and carbohydrate level on cholesterolemia and atherogenesis in cockerels on a high-fat, high-cholesterol mash. Circulation Res., in press.

(5) STAMLER, J., PICK, R., AND KATZ, L. N.: Experimental studies on the effects of protein and carbohydrate on hypercholesterolemia and atherogenesis in cockerels on a high-fat, high-cholesterol ration. Clin. Res. Proc. 5: 296, 1957.

(6) KATZ, L. N., STAMLER, J., AND PICK, R.: Nutrition and Atherosclerosis. Current Status of the Problem. Philadelphia: Lea and Febiger, in press.

A Balanced Perspective on Fats

The faddists and hyper-enthusiasts are like the gadfly's definition of a consultant: a man who knows less about your business than you do, but who charges you more for his advice than you could possibly make if you ran it the way you should instead of the way he tells you to.

One cannot in fairness differentiate in a blanket nutritional sense between fats and oils of plant or animal origin, nor in a blanket fashion can one classify all unsaturated oils as beneficial, compared with moderately saturated fats. For example, coconut oil, which is saturated, and linseed oil and tung oil, which are highly unsaturated are among those that exert a strong trend toward high serum concentrations of cholesterol. The effect of oleic acid, which is one of the dominant fatty acids occurring both in animal fats and in plant oils can be favorable or unfavorable in its effect on serum chlosterol concentration, depending on other variables in the diet. Again, the effect on serum cholesterol concentration induced by common edible fats, such as lard, cottonseed oil, and corn oil, will vary upward or downward depending on the total caloric intake derived from fats.

Research is needed to establish the significance of a great number of variables that affect fat tolerances and advantages, e.g., total caloric balance, hormone balance, ratios of fatty acids ingested, clotting control, exercise, genetic pattern, smoking habits, chemical and infection stresses, quality and quantity of protein eaten, and the intake of several vitamins (at least B_6, ascorbic acid, and choline) and minerals (especially magnesium, calcium, potassium, and sodium).—*Charles Glen King, Ph.D., speaking before the Institute of Food Technologists in Chicago on May 29, 1958.*

Nutritive Intake of Older Institutionalized Persons[1]

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THE NUMBER of persons sixty years old and over in this country has increased considerably (1), and the populations of institutions for the older person are increasing more rapidly than in any other type of institution (2). In the last decade, recognition of the importance of nutrition for this group has been growing. Stieglitz (3) comments that long life without health is not only an individual personal tragedy but a social evil which could seriously threaten our national economy. Malnutrition is one cause of ill health in the aged.

Dietitians in charge of institutional feeding are constantly trying to plan and serve nutritionally adequate meals. Previous studies (2, 4-6) show that the average meals served to persons in selected institutions for older persons are relatively adequate nutritionally when compared with the Recommended Dietary Allowances (7). However, this in no way insures that each inmate of an institution receives sufficient nutrients to meet his respective dietary needs. Factors such as the dislike of certain foods, inability to eat some foods due to poor dentition, or loss of food nutrients in cooking and handling of food may prevent an institutionalized person from obtaining the full values of the meals as planned. To date, few studies have given specific attention to the variation in nutritive intake among individuals of an institutionalized population.

The purpose of this investigation is to study the individual and group differences in nutritive intake of men and women in an institution for the aged. The plan of the study was: (a) to compare the nutritive intake of each individual with that of the average portion of food served to all inmates of the institution; (b) to compare the individual's intake with his respective Recommended Dietary Allowances; and (c) to relate each subject's blood values for hemoglobin, vitamin A, carotene, and ascorbic acid to his dietary intake.

Procedure

Forty-eight ambulatory residents, twenty-four men and twenty-four women, in a public institution for the aged were studied. The size of the group was considered feasible for the experimenters to handle. The selection of subjects was made by institutional authorities, based on the subjects' willingness to cooperate, general fitness, and lack of dietary restrictions. Thirty-four persons, or 71 per cent of the group, were sixty years old or older. Although the experimental design was planned to include *only* persons in this age group, the institutional authorities decided that it was necessary to include some younger persons.

The period of study extended for fourteen consecutive days in the winter of 1956. During the second week, the height and weight of each subject was recorded. At the same time, a finger-tip blood sample was collected. Because the blood was taken after breakfast, fruit juice was withheld until the sample had been collected.

The subjects were served the usual institutional diet. Individual "standard portions" (the average serving) of the food items were weighed at serving time. To satisfy appetites, additional weighed servings of most food items were available. Each food item remaining on a plate at the end of a meal was weighed separately, and this weight subtracted from the total of the food served to that person to find the actual intake of each subject. The standard portion was used as a basis for comparison with the actual intake of individual subjects.

For the fourteen-day period, individual food records were kept for the three daily meals and for any between-meal feedings reported by the subjects.

Food intake for each subject was calculated for: calories, protein, calcium, iron, vitamin A, thiamine, riboflavin, niacin, and ascorbic acid, according to

[1]The experimental data have been taken from a thesis submitted by Mary Susanne Wallace in partial fulfillment of the requirements for the degree of Master of Science. Received for publication October 8, 1957.

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TABLE 1 Average daily nutritive content of the standard portion and the range of intake for forty-eight subjects compared with the 1953 Recommended Dietary Allowances (7)

NUTRIENTS	STANDARD PORTION*		AVERAGE CONSUMPTION			
			Men		Women	
	Served daily	Per cent of Allowances†	Intake	Per cent of Allowances†	Intake	Per cent of Allowances†
Calories/day	2283	99	1287 –2842	50–109	1077 –2323	51–129
Protein (gm./day)	69.0	115	37.7 – 113.6	38–114	34.1 – 77.8	62–142
Calcium (gm./day)	0.951	119	0.419– 1.177	52–167	0.504– 1.039	63–130
Iron (mg./day)	14.47	120	6.21 – 16.93	52–141	5.23 – 13.05	44–109
Vitamin A (I.U./day)	7075	142	1502 –7620	30–152	2267 –6815	45–136
Thiamine (mg./day)	1.51	126	0.63 – 1.73	48–133	0.53 – 1.26	48–131
Riboflavin (mg./day)	1.78	119	0.78 – 2.33	49–146	0.89 – 1.82	64–127
Niacin (mg./day)	10.5	88	5.0 – 14.6	38–112	2.9 – 11.5	20–115
Ascorbic acid (mg./day)	70.9	98	26.6 – 98.7	36–132	10.4 – 81.0	15–116

*Daily average of food served.

†Allowances weighted according to the age and sex of all subjects.

food composition tables published by the Department of Agriculture (8). Similar calculations were made for the nutrients provided by the standard portions of all foods offered. Values for the individual subjects and the standard portions were corrected for estimated loss of nutritive value during cooking according to figures derived from a family study conducted by the Department of Agriculture (9). The averages obtained from the fourteen-day record for each individual were compared with the standard portion and with the Recommended Dietary Allowances.

Results and Discussion

Table 1 shows the nutritive values of the standard portion and the range of values for the actual food intake of the forty-eight subjects. The standard portion provided 98 per cent or more of the recommended allowances, except for niacin.

However, the range of actual intake for both men and women showed a large variation; in the case of some nutrients, the deviation was more than 300 per cent between the low and high individual intakes. Vitamin A and ascorbic acid showed the widest variations for both men and women.

The nutritive intake per person as compared with the standard portion and with the Recommended Dietary Allowances (7) is shown in Table 2. The actual intakes compared with the standard portion showed great individual variation. For every nutrient, more than half of the subjects had values less than that of the standard portion. For iron, vitamin A, thiamine, and ascorbic acid, three-fourths or more of the subjects consumed less than 100 per cent of the standard portion. Moreover, a significant number—one-third or more of the subjects—consumed less than 75 per cent of the standard portion of iron, vitamin A, thiamine, and niacin. The women tended to be lower than the men, as evidenced by the fact that even the highest value for iron, vitamin A, and thiamine did not meet the average amount of these nutrients in the standard portion. This variation may have been due to the fact that the women did not eat as much as the men and because they showed greater differences in food habits. In every case, more women had an intake of less than 75 per cent of the standard portion than the men. For example, with respect to iron, vitamin A, thiamine, and niacin, more than half of the women had less than 75 per cent of the standard portion.

In the comparison of consumption with the dietary allowances, half of the subjects consumed less than 90 per cent of the allowances for iron, niacin, and ascorbic acid. Women as a group had a lower percentage intake in comparison with the allowances than did the men for protein, iron, vitamin A, thiamine, and riboflavin. One-sixth of the women had less than half the allowances for niacin and ascorbic acid. It is significant that although the standard portion met the Recommended Dietary Allowances, many individual intakes fell far below them.

Table 3 indicates the number of subjects in the "excellent," "good," "fair," and "poor" groups in respect to the nutritive content of the blood serum, according to the rating scale established by Bessey and Lowry (10). For hemoglobin, carotene, and ascorbic acid, more than half the subjects had a rating of either "fair" or "poor."

A comparison of the results of the blood analyses with those of the diet showed a positive relationship with respect to ascorbic acid, no relationship to vitamin A, and little relationship with respect to iron. Several subjects who had dietary intakes below 50 per cent of the allowance for ascorbic acid had low blood levels of this vitamin. Most of the subjects with "fair" or "poor" blood ratings for carotene and vitamin A had a good dietary intake of vitamin A. Sixty-seven per cent of the men had a "poor" hemoglobin rating. From a dietary point of

TABLE 2 Relationship of actual food consumption to standard portion served and to the Recommended Dietary Allowances

NUTRIENT	NUMBER OF SUBJECTS									
	Intake compared with standard portion					Intake compared with Recommended Dietary Allowances (7)				
	Below 50 per cent	50 to 74 per cent	75 to 99 per cent	100 to 125 per cent	Over 125 per cent	Below 50 per cent	50 to 74 per cent	75 to 89 per cent	90 to 100 per cent	Over 100 per cent
					Men					
Protein	0	2	7	12	3	0	2	1	4	17
Calcium	1	3	5	14	1	0	2	2	0	20
Iron	2	4	14	4	0	0	2	3	2	17
Vitamin A	3	5	11	5	0	2	1	0	3	18
Thiamine	2	3	15	4	0	1	3	2	5	13
Riboflavin	1	2	6	14	1	1	1	2	2	18
Niacin	2	0	10	10	2	2	6	14	1	1
Ascorbic acid	4	1	9	9	1	4	1	7	4	8
					Women					
Protein	1	9	11	3	0	0	5	3	6	10
Calcium	0	6	13	5	0	0	3	3	3	15
Iron	6	13	5	0	0	2	12	5	1	4
Vitamin A	5	11	8	0	0	1	4	6	4	9
Thiamine	7	12	5	0	0	1	6	4	6	7
Riboflavin	0	8	14	2	0	0	3	5	4	12
Niacin	3	14	6	1	0	4	10	7	2	1
Ascorbic acid	5	6	11	2	0	5	6	1	9	3

TABLE 3 Ratings of subjects according to blood serum analyses

RATING*	PERCENTAGE OF SUBJECTS			
	Hemoglobin	Vitamin A	Carotene	Ascorbic acid
		Men		
Excellent	0	34	0	21
Good	0	29	17	21
Fair	33	8	47	37
Poor	67	29	37	21
		Women		
Excellent	4	59	0	4
Good	8	12	12	17
Fair	59	8	59	29
Poor	29	21	29	50

*According to scale established by Bessey and Lowry (10).

view, there was no apparent reason for this, since the men's diets, on the whole, were better than those of the women.

Summary

An investigation was made of the individual food intake of twenty-four men and twenty-four women in an institution for older persons. The subjects' food consumption was recorded for fourteen days, and a blood sample from each subject was taken. The nutritive intake of each individual was compared with the average amount of nutrients in the food served (standard portion) and with the Recommended Dietary Allowances. The blood values for hemoglobin, vitamin A, carotene, and ascorbic acid were related to dietary intake for each subject and were rated according to a scale established by Bessey and Lowry.

Less than half of the subjects received more than 90 per cent of the dietary allowances for protein, iron, niacin, and ascorbic acid. Women as a group had a lower nutritive intake in comparison with the allowances than did the men.

The individual nutritive intakes showed considerable variation, some individuals having a nutritive intake three times as great as others, particularly in the case of vitamin A and ascorbic acid. No apparent relationship was found between the blood levels for vitamin A and carotene and the dietary intake of vitamin A, or between the hemoglobin and dietary intake of iron. A positive relationship was found between low dietary intakes of ascorbic acid and the blood levels of that nutrient.

References

(1) ROBERTS, P. H., KERR, C. H., AND OHLSON, M. A.: Nutritional status of older women. Nitrogen, calcium, phosphorus retentions of nine women. J. Am. Dietet. A. 24: 292, 1948.

(2) BRINE, C. L.: Institutional Market Potential for Oilseed Proteins. U.S.D.A. Marketing Research Report No. 151, Dec., 1956.

(3) STIEGLITZ, E. J.: Geriatric Medicine: The Care of the Aging and the Aged. 2nd ed. Philadelphia: W. B. Saunders Co., 1949.

(4) BRINE, C. L., and TATE, E. B.: Effect of food losses on nutritive content of diets in four institutions. J. Am. Dietet. A. 32: 19, 1956.

(5) RAFSKY, H. A., AND NEWMAN, B.: A quantitative study of diet in the aged. Geriatrics 3: 267, 1948.

(6) VINTHER-PAULSEN, N.: Investigations of the actual food intake of elderly chronically hospitalized patients. J. Gerontol. 5: 331, 1950.
(7) FOOD AND NUTRITION BD.: Recommended Dietary Allowances, Revised 1953. Natl. Acad. Sci.—Natl. Research Council Pub. 302, 1953.
(8) WATT, B. K., AND MERRILL, A. L.: Composition of Foods—Raw, Processed, Prepared. U.S.D.A. Agriculture Handbook No. 8, 1950.
(9) CLARK, F., AND FINCHER, L.: Nutritive Content of Homemakers' Meals—Four Cities, Winter, 1948. U.S.D.A. Agriculture Information Bull. 112, 1948, page 67.
(10) BESSEY, O. A., AND LOWRY, O. H.: Nutritional assay of 1,200 New York State school children. *In* Meals for Millions. Final Report of the New York Joint Legislative Committee on Nutrition. N. Y. State Legislative Document No. 61, 1947, page 167.

Food Service in Nursing Homes and Homes for the Aged

The following recommendations pertaining to nutrition and food service in nursing homes and homes for the aged were adopted at the National Conference on Nursing Homes and Homes for the Aged held in Washington in February.

(1) The nutritional needs of persons in nursing homes and homes for the aged should be met in accordance with the National Research Council's current Recommended Dietary Allowances, adjusted for the population concerned. These allowances may be met by many food combinations designed to meet the cost and cultural demands of the patients and residents of the home.

(2) The nutritional needs of patients and residents should be met through foods; nutrient concentrates should be given only on prescription.

(3) Any processed foods served in nursing homes and homes for the aged should be processed by safe and approved methods.

(4) The licensing agency should help make it possible for nursing home administrators to offer a food service which will meet the Recommended Dietary Allowances. This will require:

(a) Information on selection and use of kinds and amounts of foods at varying cost levels.
(b) Use of qualified personnel and/or authoritative materials. (Some sources are official and non-official health and welfare agencies at national, state, and local levels; colleges and universities with home economics departments; hospital dietitians and dietetic associations; federal, state, and local departments of agriculture and extension services).

(5) At least three meals a day should be provided with not more than a 14-hr. span between a substantial evening meal and breakfast.

(6) Food should be prepared in ways to conserve the nutritive value, suitably cooked for the digestive capacity of the groups served and served in a manner acceptable to patients and residents.

(7) Table service for individuals or groups should be available to all who can and will eat at table.

(8) Because of the therapeutic value of getting the patient up for meals, wherever possible this practice should be followed whether it affects the classification of the patient or the rate charged.

(9) The entire licensing staff of the regulatory agency should be familiar with the criteria for evaluating the food service and the specific assistance for food service that may be provided to the operator of the home.

(10) The licensing agency should assume responsibility for education and training in all phases of food service for all personnel in nursing homes and homes for the aged. Such education and training should include individual and group conferences and on-the-job and formal training for present, new, and prospective employees. Qualified personnel from the following sources could be used: health and welfare agencies, home economics departments of colleges and universities, hospital dietary departments, and departments of vocational education.

(11) The formal training of professional workers concerned with the care of patients and residents of nursing homes and homes for the aged should emphasize geriatrics and especially nutrition.

(12) Regulations should require that there be made available for review the menus as served, a record of kinds and amounts of food used for a given period of time and the number of people served during this period.

(13) A national project should develop a cost accounting system specifically for nursing homes and homes for the aged, and appropriate forms should be developed for use in food cost accounting.

(14) Further studies of the nutritional requirements of the aged person in the nursing homes and homes for the aged should be encouraged.—*From Social Legislation Information Service, Issue No. 15, 85th Congress, March 10, 1958.*

Study of Adolescent Boys' Requirements

Planning Low-Riboflavin and Low-Thiamine Diets[1]

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THIS PAPER reports the dietary management during recent experiments which involved feeding of adolescent boys on controlled diets. In order to study riboflavin (1) and thiamine (2) requirements for this age group, it was desired to plan diets of natural foods as low as possible in riboflavin or thiamine. The widespread distribution of these two vitamins, especially in the foods considered essential for growth, made it difficult to find sufficient foods of low vitamin content to create variety in the meals and to maintain the subjects' interest during an extended study. The problem was further complicated by the relatively high nutrient needs of adolescent boys who, being in a period of rapid physical growth and development, had large caloric requirements. In addition, it was important to meet the boys' high protein and calcium needs, despite the fact that the very foods which are high in protein and calcium generally contain riboflavin and thiamine also. Several papers which have reported details of workable diets for thiamine (3, 4) and riboflavin (5) studies with adults supplied helpful suggestions on vitamin B-low foods and recipes which might be used, although none described diets as high in caloric content as those necessary for these adolescent subjects. Previous experience in this laboratory, gained in studies of calcium needs of adolescent boys (6), was also of great value in gauging possible nutritive needs and food preferences.

General Procedures

The studies on nutrient requirements were conducted during the summers of 1953 and 1954. The riboflavin intake was varied in 1953, and in 1954, the thiamine intake. Eight boys, ages fourteen to seventeen, participated in the two studies—each of ten weeks' duration. The subjects lived together in a single housing unit where the meals were prepared and served by a dietitian and assistants. A basal diet of low riboflavin or low thiamine content was fed throughout each experiment, with periodic additions of graded doses of the vitamin under study. Three daily menus were worked out for each study. At least three separate menus seemed necessary to avoid monotony. Since the metabolic periods were five days in length, the three menus referred to as *a*, *b*, and *c* (Table 1), were rotated within a five-day period with menus *c* and *b* appearing twice, and menu *a* once. Three meals a day were served, at 7:00 a.m., 12 noon, and 5:00 p.m. In addition, an evening snack was regularly provided.

Riboflavin-Low Diets

NUTRITIVE VALUE OF DIET

On the basis of the authors' experience, it was decided that a diet containing approximately 4000 calories should be high enough in energy content to support the growth and activity needs of these adolescent boys. In order to furnish this high caloric intake, fat was used to supply 43 per cent of the calories. The use of generous amounts of butter and other fats rather than jelly or other foods high in carbohydrate permitted the serving of less bulky meals than would have been possible otherwise.

The subjects varied considerably in size (Table 2) and degree of activity, and consequently, in caloric needs. Initial heights of these subjects ranged from 5 ft. 3.6 in. to 6 ft. 2.4 in. and corresponding weights from 85 to 221 lb. The basic diet as finally designed was calculated to contain 4027 calories (Table 3). The boys adjusted their caloric intakes during the first few days of the study to their individual appetites. In addition, daily body weights were watched carefully for indications of caloric adequacy. To accomplish the caloric adjustment required, the size of servings of basic diet for subjects V.S. and J.R. were cut to supply 75 and 87 per cent of the calories, respectively. Subjects desiring more calories than

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TABLE 1 **Foods and amounts for three menus used in riboflavin and thiamine studies of adolescent boys**

MENU A		MENU B		MENU C	
Food	Amount	Food	Amount	Food	Amount
Low-Riboflavin Diet*					
	gm.		*gm.*		*gm.*
Breakfast		*Breakfast*		*Breakfast*	
Orange juice, frozen	200	Grapefruit juice, frozen	200	Prune juice	200
Corn flakes	40	Puffed Rice	40	Cream of Wheat, unenriched	40
Sugar, granulated	20	Sugar, granulated	20	Sugar, granulated	20
Cream, 25%	75	Cream, 25%	75	Cream, 25%	75
Casein bread*†	50	Casein bread	50	Casein bread	50
Butter	20	Butter	20	Butter	20
Jam	40	Apple butter	40	Jelly	40
Treated milk	180	Treated milk	180	Treated milk	180
Noon meal		*Noon meal*		*Noon meal*	
Bacon (broiled weight)	15	Tuna casserole†	one serving	Beef, round ground	75
Rice, unenriched (raw weight)	40			Macaroni, unenriched	40
Cabbage, shredded	50	Celery sticks	30	White sauce	152
French dressing	20	Casein bread	50	Carrot sticks	40
Casein bread	50	Butter	20	Casein bread	50
Butter	20	Jam	40	Butter	20
Apple butter	40	Treated milk	180	Jelly	40
Treated milk	180	Crushed pineapple, canned	100	Treated milk	180
Pears, canned	100	Casein cookies	50	Apricots, canned	100
Casein cookies†	50			Casein cookies	50
Evening meal		*Evening meal*		*Evening meal*	
Halibut, baked	100	Chicken breast, baked	90	Corned beef, ground	30
Potato chips	30	Potatoes, riced	150	Potatoes, riced	150
Carrot sticks	100	Wax beans, canned	50	Lima beans, frozen	75
Casein bread	50	Shredded lettuce	25	Casein bread	50
Butter	20	French dressing	20	Butter	20
Jelly	40	Casein bread	50	Apple butter	40
Treated milk	180	Butter	20	Treated milk	180
Ice cream	130	Jelly	40	Cherry tapioca	130
Fudge, plain (brown sugar)	50	Treated milk	180	Fudge, plain (brown sugar)	50
Iced tea (ml.)	250	Apple crisp	240	Iced tea (ml.)	250
		Fudge, plain (brown sugar)	50		
		Iced tea (ml.)	250		
Evening snack		*Evening snack*		*Evening snack*	
Lemonade (ml.)	240	Lemonade (ml.)	240	Lemonade (ml.)	240
Cookies, shortbread	ad lib	Cookies, shortbread	ad lib	Cookies, shortbread	ad lib
Low-Thiamine Diet‡					
Breakfast		*Breakfast*		*Breakfast*	
Prune juice	100	Grapefruit juice, frozen	100	Apple juice	100
Krumbles	40	Sugar Jets	40	Sugar Crisp	40
Sugar, granulated	20	Sugar, granulated	20	Sugar, granulated	20
Casein bread	50	Casein bread	50	Casein bread	50
Butter	10	Butter	10	Butter	10
Jelly	40	Apricot preserves	40	Jelly	40
Treated milk	210	Treated milk	210	Treated milk	210
Noon meal		*Noon meal*		*Noon meal*	
Eggs, scrambled	87	Tuna casserole	250	Beef, round ground	75
Tomato catsup	30	Celery sticks	30	Macaroni, unenriched	40
Cabbage, shredded	50	Casein bread	50	White sauce	152
Mayonnaise	13	Butter	10	Carrot sticks	40
Rice, unenriched (raw weight)	40	Jam	30	Casein bread	50
Casein bread	50	Treated milk	210	Butter	10
Butter	10	Peaches, canned	100	Jelly	30
Jelly	30	Macaroons	80	Treated milk	210
Treated milk	210	Casein cookies	50	Apricots, canned	100
Pears canned	100			Casein cookies	50
Gelatin whip	193			Angel cake	50
Casein cookies	50				
Evening meal		*Evening meal*		*Evening meal*	
Halibut, baked	100	Chicken breast, baked	90	Corned beef, ground	40
Potato chips	30	Potatoes, riced	75	Potatoes, riced	100
Green beans, canned	100	Beets, canned	100	Wax beans, canned	50
Casein bread	50	Lettuce, shredded	25	Margarine	15
Butter	10	Mayonnaise	13	Casein bread	50
Jelly	30	Casein bread	50	Butter	10
Treated milk	210	Butter	10	Jelly	30
Ice cream	130	Jam	30	Treated milk	210
Caramel sauce	40	Treated milk	210	Cherry tapioca	130
Milk chocolate bar	30	Apple crisp	240	Milk chocolate bar	30
Iced tea (ml.)	250	Milk chocolate bar	30	Iced tea (ml.)	250
		Iced tea (ml.)	250		
Evening snack		*Evening snack*		*Evening snack*	
Lemonade (ml.)	240	Lemonade (ml.)	240	Lemonade (ml.)	240
Cookies, shortbread	ad lib	Cookies, chocolate creme	ad lib	Cookies, shortbread	ad lib

*Total calculated riboflavin content: Menu A, 639 mcg.; Menu B, 761 mcg.; Menu C, 720 mcg. Menus were used in the following order in five-day intervals: *c*, *a*, *b*, *c*, *b*.

†See appendix for recipe.

‡Total calculated thiamine content: Menu A, 509 mcg.; Menu B, 514 mcg.; Menu C, 518 mcg. Menus were used in the following order in five-day intervals: *c*, *a*, *b*, *c*, *b*.

TABLE 2 **Weight and height gains of adolescent boys during sixty-nine-day riboflavin and thiamine studies**

SUBJECTS	AGE AT START OF STUDY		WEIGHT		HEIGHT		MEAN DAILY CALORIC INTAKE*
			Initial	Final	Initial	Final	
Riboflavin Study							
	yr.	*months*	*lb.*	*lb.*	*in.*	*in.*	
R.B.	14	3	172.0	181.0	74.4	74.9	4275
M.S.	14	5	118.0	129.0	65.2	66.2	3772
D.A.L.†	15	1	122.5	133.0	68.4	69.1	4056
V.S.	15	2	85.0	89.8	63.6	64.5	2757
J.R.	15	3	140.0	154.5	70.2	70.6	3609
R.W.†	15	7	142.0	146.0	69.0	69.2	4085
L.M.†	15	10	156.0	162.5	69.4	69.4	4163
D.K.S.†	16	6	221.0	231.8	72.5	73.2	4393
Thiamine Study							
J.W.	14	2	142.5	143.0	67.8	67.8	3651
S.K.	14	6	154.8	161.8	69.4	70.1	3797
D.R.L.	14	7	121.0	130.8	66.5	66.6	3510
L.H.	15	11	158.5	161.0	66.1	66.1	3611
D.A.L.†	16	1	130.2	136.0	69.2	69.5	3663
R.W.†	16	7	148.2	150.0	69.2	69.5	3652
L.M.†	16	10	176.4	184.5	70.1	70.4	4077
D.K.S.†	17	6	237.2	243.5	73.8	74.1	3631

*Calculated from Bowes and Church (9) and Agriculture Handbook No. 8 (10).
†These subjects participated in both studies.

the basal diet supplied were allowed *ad libitum* consumption of a specially-prepared shortbread cookie, packaged in 50-gm. portions which supplied 275 calories per portion and negligible amounts of riboflavin. Mean caloric intakes for both studies are listed in Table 2, as well as weight and height changes in Table 2.

Protein (108 gm.) supplied 11 per cent of the basal diet and was well above the 85 gm. recommended by the National Research Council for thirteen to fifteen-year-old boys (7). Previous experience in this laboratory, however, had indicated improved nitrogen retention when the protein intake was increased from 85 gm. to amounts above 100 gm. It was possible to provide this high protein intake with little change in riboflavin by using vitamin-free casein, which supplied 36 of the total of 108 gm. protein. Special recipes for bread and cookies incorporating casein in a palatable fashion were developed. The bread had an agreeable, nutty flavor, and when eaten with generous amounts of butter and jam or jelly was well accepted.

Milk provided 18.9 of the 108 gm. protein. The milk was treated by adsorption on florisil, a process which removed over 90 per cent of the riboflavin and thiamine, but left the calcium, nitrogen, and phosphorus content unchanged (8). No off-flavors developed through the use of this process. After treatment, the milk was re-pasteurized and used for drinking, as a base for ice cream, and for the 25 per cent cream for breakfast cereal. The 25 per cent cream was prepared by adding three parts treated milk to one part cream with butterfat content of 75 per cent. The ice cream[4] contained 6.5 per cent milk solids from florisil-treated milk and 12.0 per cent butterfat.

Foods low in riboflavin were selected for the diet on the basis of published riboflavin values (9, 10). The foods and amounts used in the three menus are shown in Table 1. As calculated, menus *a*, *b*, and *c* supplied 639, 761, and 720 mcg. riboflavin respectively or a mean of 720 mcg. for the five-day period. The daily values, as analyzed by the fluorometric method (11) averaged 665 $\pm$ 18 mcg., 946 $\pm$ 35 mcg., and 761 $\pm$ 26 mcg., for menus *a*, *b*, and *c*, respectively, and 816 mcg. for the five-day period. Other studies have also reported analytical values of riboflavin higher than calculated values, (12-14).

To supply the recommended allowances (7) for nutrients other than riboflavin, it was necessary to add several daily supplements. These were calcium monophosphate in capsules supplying 500 mg. calcium per day; ferric citrate, supplying 6 mg. iron daily, added to the casein cookies; 800 mcg. thiamine hydrochloride added to the day's supply of milk; and 3 drops Natola oil supplying 3000 I. U. vitamin A and 600 I. U. vitamin D, placed on a small piece of bread. The total quantities of nutrients furnished by the basal menus and by the supplements are listed in Table 3. Supplements of riboflavin for the 1953 study are not recorded in the table, as these varied from 0.5 to 1.0 mg. according to the stage of the study. These supplements were

[4]Prepared through courtesy of Dr. Paul H. Tracy, Professor of Dairy Technology, University of Illinois.

TABLE 3 Calculated nutritive value of diets* used in riboflavin and thiamine studies

Nutrient	LOW-RIBOFLAVIN DIET		LOW-THIAMINE DIET	
	Basal diet	Supplement	Basal diet	Supplement
Calories	4027		3582	
Protein (gm.)	108		114	
Fat (gm.)	194		144	
Carbohydrate (gm.)	477		471	
Calcium (mg.)	953	500	1019	500
Phosphorus (mg.)	1363		1365	
Iron (mg.)	9.5	6.0	10.2	5.0
Vitamin A (I.U.)	8597	3000	7699	3000
Vitamin D (I.U.)	123	600	157	600
Thiamine (mcg.)	692	800	515	
Riboflavin (mcg.)	720		935	1500
Niacin (mg.)	18.9		18.3	
Ascorbic acid (mg.)	130		62	50

*Mean for five-day period of menus *c*, *a*, *b*, *c*, *b* (see Table 1).

added directly by pipette into each subject's total daily milk allowance and thus allocated throughout the day into three equal portions.

STORAGE AND HANDLING OF FOOD

Every effort was made to keep to a minimum variation in nutrient content due to use of several lots of the same food. In the case of staples, food of one brand and quality was purchased in sufficient amounts for the entire study. Round of beef was obtained from one animal, visible fat was removed, and the entire portion was ground twice, mixed, and individual portions weighed and frozen in advance of the study. Fresh cabbage, carrots, celery, and lettuce were the only items purchased frequently. It was felt that the greater appeal and acceptability of these fresh vegetables justified any small variation due to use of several lots.

All foods were weighed on a tortion balance sensisitive to 0.1 gm. Liquids, other than the milk which was weighed, were measured by volume. Ten servings of each food were prepared, i.e., eight servings for the subjects, one for the counselor who lived and ate with the boys, and one for daily analyses.

Most of the food preparation was done on an individual basis. For example, for dishes which were prepared on top of the stove, such as the sauces for the tuna casserole and for the macaroni, individual Pyrex skillets served as cooking and serving dishes. Items which required steaming, such as the rice, macaroni, noodles, and Cream of Wheat, were weighed into individual pottery casseroles (marmites), fitted with covers, and, in the case of the rice and cereal, were served in these same dishes. Oven dishes, such as the ground beef and apple crisp, were weighed into Pyrex ramekins. These also did double duty as cooking and serving dishes. Foods such as corned beef, chicken, halibut, potatoes, and other fresh vegetables were shredded or ground and mixed thoroughly before weighing to insure homogeneity of individual portions. The canned fruits were lightly drained of liquid before weighing, and weighed portions of juice were returned to the diced fruit before serving. The recipes for one item which proved to be particularly popular, viz., the tuna casserole, appears with those for casein cookies at the end of this paper.

Each boy was expected to eat every morsel of food. Rubber scrapers were used to clean plates and distilled water to rinse glasses containing juices or milk. The boys cooperated to such an extent that their dishes were almost always nearly spotless after a meal.

Thiamine-Low Diets

Experience gained in devising and using the low-riboflavin diets was a great aid in planning low-thiamine diets the following summer. Many of the same foods were used, as can be seen by comparing the diets in Table 1. Because of the boys' adverse comments concerning the large amount of fat on the low-riboflavin diet, the fat intake was reduced from 194 to 144 gm., or to 36 per cent of the total calories. The lowered fat content improved the palatability. Since it seemed impractical to serve more carbohydrates to replace fat calories, the total number of calories, calculated to be 3582, was some 400 less in 1954 than in 1953. Again, it was necessary to adjust individual portions to the varying caloric needs of the subjects. The smallest boy (D.R.L.) received half portions of low-protein foods, such as butter, jam, rice, macaroni, and spaghetti during the last two weeks. Others received extra calories from a commercial chocolate creme cookie low in thiamine, but provided 246 calories per 50 gm. (about four cookies).

The casein bread and cookies, which had been used successfully to increase the protein content in the low-riboflavin diets, were again used in the same quantities. Specially treated milk was also used. Egg whites were a new source of protein which could be included on low-thiamine diets, although not on low-riboflavin diets. These appeared daily in such dishes as gelatin whip, angel food cake, and macaroons. The mean daily protein intake was 110 gm. by analysis.

The thiamine content of the menus, shown in detail in Table 1, was calculated to be 509, 514, and 518 mcg. for menus *a*, *b*, and *c*, respectively. The mean value for the five-day period was 515. The analyzed values (by the thiochrome method [15]) were 570 $\pm$ 33 mcg., 636 $\pm$ 52 mcg., and 586 $\pm$ 42 mcg. for menus *a*, *b*, and *c*, respectively.

The use of supplements increased the intake of all other nutrients to the generous levels shown in Table 3. In the thiamine study, the supplements

were: 500 mg. calcium monophosphate, 5 mg. iron as ferric citrate, 1500 mcg. riboflavin, 50 mg. ascorbic acid, 3000 I. U. vitamin A, and 600 I. U. vitamin D from Natola oil. These were added to the diet in the same fashion as in the riboflavin study. Thiamine supplements ranged from 400 to 2100 mg. and were added to the daily milk as described for the riboflavin study.

The methods of buying, weighing, and preparing foods were essentially the same as those listed under the section on riboflavin.

Discussion

The first ten days of both studies were considered as preliminary or adjustment periods. This was a time for menu changes to be made, for subjects to indicate whether additional or fewer calories were needed, and for the general process of becoming accustomed to the routines of sample-collection and disciplined eating. The variations in caloric intake during the first few days were considerable. For example, at the beginning of the thiamine study, the boys were so intrigued with the chocolate cookies offered as caloric supplements that on one day, one subject (R.W.) consumed 1476 calories over and above what was furnished by the basal diet. His consequent caloric intake of more than 5000 calories for that day certainly reflected the novelty of the cookies rather than actual caloric need. Before these ten days were over, the novelty had worn off and caloric selection was more in keeping with individual need. Caloric intake for each subject after this preliminary period was quite constant throughout the remainder of the experiment.

The adequacy of appetite as a guide for caloric intake of the boys is perhaps best assessed by weight and height changes. It was assumed that each boy would gain in weight and possibly in height, since all were judged to be in a growing phase of life. Comments of the boys were carefully noted to ascertain that each boy felt he had enough food, but was not uncomfortable. It can be seen from Table 2 that each boy did gain some weight, the amount varying between 0.5 lb. (J.W., 1954 study) and 14.5 lb. (J.R., 1953 study) for the sixty-nine-day periods. Height increases were recorded for the younger boys and subject D.K.S. during the first summer and for subject S.K. during the second summer. Subjects D.A.L., R.W., L.M., and D.K.S., who repeated the study, gained 1.1, 0.5, 1.0, and 1.5 in., respectively, from the initial measurement in 1953 to the final one in 1954.

It is apparent that most of these adolescent boys were consuming more calories than are suggested by the National Research Council allowances (7). The 3200 calories proposed for the thirteen-to-fifteen-year-age group assumes a 108-lb., 64-in. boy. In the studies reported here, all boys but one were heavier than this standard. During the second summer, four of the boys fell in the sixteen-to-twenty-year bracket, for which an allowance of 3800 calories is suggested. Three of these boys used less than 3800 and one, more. The preceding year, however, all four had consumed well over 4000 calories per day. The disparity between the actual and the recommended consumption may be ascribed to the varying ages at which adolescents reach the zone of rapid growth. It appears that the boys in this study may have reached this zone at an earlier age than those covered by the National Research Council's recommendations.

A diet composed of foods as similar as possible to those commonly eaten by subjects in their own homes was chosen both in order to maintain subjects' interest over an extended period and to maintain a normal balance between nutrients. Synthetic diets, besides being unpleasant to eat, have been reported to cause unexpectedly high caloric needs (16) and to elicit changes in vitamin absorption or synthesis (17). A diet of natural foods is also more likely to supply unidentified growth factors than is a synthetic diet.

Familiar foods had great appeal for the subjects. For example, the commercial chocolate creme cookies used on the low-thiamine diet were much more popular with the boys than specially prepared shortbread cookies used for extra calories the first year. Ice cream was popular even though it was prepared from the florisil-treated milk. The one fresh vegetable served each day added considerable color and a varied texture. Salads seemed to be the least popular food. Hot dishes were preferred even on hot days.

The fact that the counselor who supervised the boys was willing to share the diet with them aided in its acceptance. Another vital factor in the success of the regimen was the attitude of the dietitians and their relationships with the subjects. The dietitians, through experimentation, evolved acceptable recipes and made the food they had to work with as attractive as possible. They relayed the reactions of the subjects to the director of the study and encouraged the boys to accept the restricted and rather monotonous diet in good spirit.

The boys proved to be as reliable subjects as college men and women who have participated in similar studies in this laboratory. Although adolescence is the age where "cutting-up" and general resentment of authority seem to be expected, there actually were few behavior problems. Each boy adjusted well to the discipline and restrictions and seemed proud to be part of a scientific experiment. The boys were encouraged to express reactions to various foods and they selected their meal hours after a discussion held before the study began.

The best evidence that they were satisfied with

the diets was their eagerness to return to the Diet House for further studies. Four of the first group actually did participate again during the second summer, and six of these asked to be allowed to continue on diet studies during the following school year.

Summary

Some dietary problems encountered in designing diets of low-riboflavin or low-thiamine content and high caloric and protein value are discussed. Six menus are presented. The three designed for riboflavin studies used in a five-day sequence contained by analysis, a mean of 816 mcg., or 209 mcg. riboflavin per 1000 calories daily. The other three, designed for thiamine studies used in a five-day sequence, provided a mean of 598 mcg., or 167 mcg. thiamine per 1000 calories daily. Both sets of menus were used successfully in studies of riboflavin and thiamine requirements of adolescent boys. Recipes of several special foods appear below.

References

(1) CHEN, S. D., AND SMITH, J. M.: Riboflavin needs of adolescent boys. Unpublished data.

(2) DICK, E. C., CHEN, S. D., BERT M., AND SMITH, J. M.: Thiamine requirements of eight adolescent boys as estimated from urinary excretion. J. Nutrition, in press.

(3) ANDERSON, M., MICKELSEN, O., AND KEYS, A.: Diets and food items for the experimental production of thiamine deficiency in man. J. Am. Dietet. A. 22: 1, 1946.

(4) DAUM, K., TUTTLE, W. W., WILSON, M., RHODES, H., AND OSBORNE, M.: Influence of various levels of thiamine intake on physiologic response. 1. Low-thiamine diets. J. Am. Dietet. A. 24: 945, 1948.

(5) HORWITT, M. K., SAMPSON, G., HILLS, O. W., AND STEINBERG, D. L.: Dietary management in a study of riboflavin requirements. J. Am. Dietet. A. 25: 591, 1949.

(6) SMITH, J. M., AND MCKEY, B. V.: Unpublished data.

(7) FOOD AND NUTRITION BD.: Recommended Dietary Allowances, Revised 1953. Natl. Acad. Sci.—Natl. Research Council Pub. No. 302, 1953.

(8) ADAMSON, L. F.: Removal of thiamine and riboflavin from milk for dietary use. Science 117: 253, 1953.

(9) BOWES, A. DEP., AND CHURCH, C. F.: Food Values of Portions Commonly Used. 7th ed. Philadelphia: A. deP. Bowes, 1951.

(10) WATT, B. K., AND MERRILL, A. L.: Composition of Foods—Raw, Processed, Prepared. U.S.D.A. Agriculture Handbook No. 8, 1950.

(11) PETERSON, W. J., BRADY, D. E., AND SHAW, A. O.: Fluorometric determination of riboflavin in pork products. Indust. & Engin. Chem., Anal. Ed. 15: 634, 1943.

(12) HATHAWAY, M. L., AND LOBB, D. E.: A comparison of riboflavin synthesis and excretion in human subjects on synthetic and natural diets. J. Nutrition 32: 9, 1946.

(13) KEYS, A., HENSCHEL, A., TAYLOR, H. L., MICKELSEN, O., AND BROZEK, J.: Experimental studies on man with a restricted intake of the B vitamins. Am. J. Physiol. 144: 5, 1945.

(14) THOMAS, R. U., RUTLEDGE, M. M., BEACH, E. F., MOYER, E. Z., DRUMMOND, M. C., MILLER, S., ROBINSON, A. R., MILLER, O. N., CORYELL, M. N., AND MACY, I. G.: Nutritional status of children. 13. Accuracy of calculated intakes of food components with respect to analytical values. J. Am. Dietet. A. 26: 889, 1950.

(15) ASSOCIATION OF VITAMIN CHEMISTS, INC.: Methods of Vitamin Assay. N. Y.: Interscience Publishers, Inc., 1947.

(16) ROSE, W. C., COON, M. J., AND LAMBERT, G. F.: The amino acid requirements of man. 6. The role of the caloric intake. J. Biol. Chem. 210: 331, 1954.

(17) EVERSON, G., WHEELER, E., WALKER, H., AND CAULFIELD, W. J.: Availability of riboflavin of ice cream, peas, and almonds judged by urinary excretion of the vitamin by women subjects. J. Nutrition 35: 209, 1948.

RECIPES FOR EXPERIMENTAL DIETS

Casein Bread—*Yield:* 6 loaves.

54	gm. active dry yeast*	105	gm. shortening
2385	ml. distilled water	2700	gm. unenriched, all-purpose flour
76.5	gm. iodized salt	675	gm. vitamin-free casein
122.4	gm. sugar		

Dissolve yeast in approximately one-third of water at a temperature of 94° to 104°F. Heat remaining water to nearly boiling; pour over salt, sugar, and fat in large pan. Sift flour with casein four times. Cool liquid to 140°F. Add about half the flour-casein mixture. Mix thoroughly with a wooden spoon. Add yeast suspension and all but ½ to ¾ c. flour-casein mixture. Blend in as well as possible. Turn out onto board on which remaining flour-casein mixture has been spread. Knead until all dry ingredients have been incorporated. Let rise to 80° to 85°F. After 1 hr., punch down lightly. Turn out on board. Handle gently. Weigh entire batch and divide into six equal amounts. Shape six loaves. Place in greased pans. Let rise again until double in bulk. Bake 15 min. at 425°F., then 30 min. at 350°F.

*A low-vitamin yeast supplied by Anheuser-Busch, Inc., St. Louis.

Casein Cookies—*Yield:* 1200 gm.

440	gm. margarine	5	gm. iodized salt
258	gm. confectioner's sugar	548	gm. unenriched, all-purpose flour
100	gm. vitamin-free casein	100	ml. distilled water
1	Tbsp. cinnamon	10	gm. vanilla

Cream margarine and sugar. Add sifted dry ingredients, water, and vanilla. Mix well. Spread on cookie sheet. Cover with heavy wax paper and roll with rolling pin to insure even thickness. Bake at 350°F. for 35 min. Cut into 24 equal portions. Reweigh in 50-gm. packets and wrap in wax paper or aluminum foil.

Tuna Casserole—*Yield:* 1 serving.

40	gm. spaghetti	21	gm. margarine
¼	tsp. salt	100	ml. chicken broth
14	gm. unenriched, all-purpose flour	⅛	tsp. salt
		75	gm. tuna

Weigh spaghetti into large individual casseroles. Add salt and distilled water to cover. Steam over water for 1 hr. or until done. Make sauce from flour, margarine, chicken broth, and salt in individual Pyrex skillets. Add spaghetti and tuna and mix. Serve immediately.

Determining Layout Efficiency in the Kitchen[1]

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Economical manufacture of any product, whether it be in industry or in the institutional kitchen, depends on the efficiency of the layout of equipment. In the institutional kitchen, the layout efficiency may easily be analyzed by using the technique of the cross chart, a tool employed effectively in industry. Its use and construction are explained here.

PLANNING INSTITUTIONAL kitchens presents many challenging questions regarding the layout of equipment. The following factors are inherent in the questions which arise and are of concern in functional kitchen planning.

(a) The heterogeneity of the menu items to be produced.

(b) The number of different processes required for the production of the menu items.

(c) The variation in the sequences of these processes.

Industry has developed and adopted basic principles of layout planning, which provide the most economical (lowest cost) manufacture of industrial products. Some of these principles are listed below and may be applied to the manufacture, preparation, or production of menu items in institutional kitchens.

General Principles

(a) There should be a flow of production from the point of receipt of raw materials through the various processes required, to the finished product, with a minimum of interference.

(b) A decrease in production costs should be brought about without a lowering of the desired quality of the product.

(c) Shorter production time is advantageous in reducing manufacturing costs.

(d) Increase in production should be accompanied by a decrease of employees' work effort, and the reduction of fatigue.

(e) Provisions should be made for the comfort and safety of employees.

(f) Layout arrangement should provide ease of supervision.

Specific Principles

(a) Materials should be moved minimum distances. Amrine *et al.* (1) state that this may be in a straight line, a circular path, or in other patterns.

(b) Back-tracking should be minimized as this usually increases distances and can cause traffic congestion.

(c) Processing machines should be arranged to reduce handling of materials as much as possible. Every move should be for the purpose of changing the form or condition of the product.

(d) In planning for space economy, consideration should be given to utilization of cubic feet available, as well as to the square feet of floor area.

(e) The layout must be flexible enough to allow for changes in methods and types of products. Immer (2) adds to this principle the additional factor of planning for building expansion.

(f) The plan of arrangement should provide for the maximum use of the equipment.

The Cross Chart

Industry has adopted the use of a "cross chart" as a means of analyzing equipment and related processes involved in multi-product manufacturing so that the foregoing principles may be implemented. The cross chart provides a useful method for planning layouts where the amount of data is too great or too

[1]Part of New York State Research Project No. 26, "Relationship Between Ingredients and Processes Used in Institutional Recipes and the Requirements for and Placement of Equipment in Institutional Kitchens." Received for publication August 19, 1957.

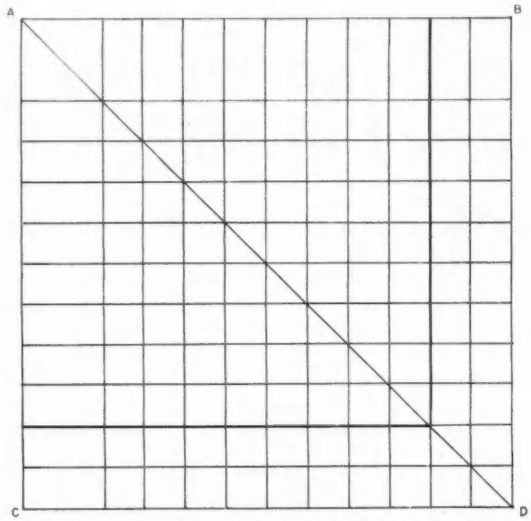

FIG. 1. *Form used in working out a cross chart to analyze equipment and related processes in multi-product manufacturing.*

complex to be interpreted by flow charts, process charts, and similar devices.

The cross chart enables one to study the frequencies of material movement between one machine and another in the manufacturing of a product. This includes frequencies of material movement between adjacent machines, frequencies of the by-passing of machines, and the frequencies of the back-tracking of materials during manufacture.

By recording the total frequencies of movement of material between any two machines, and, by comparing these total frequencies, machine arrangements may be justified or rearrangements recommended.

Figure 1 shows a cross chart form on which may be recorded these frequencies of material movement among the machines used for the processes required in manufacturing or in producing menu items in institutional food operation. The number of squares on the A-B axis of a cross chart is always equal to the number of squares on the A-C axis. Total squares will equal the number of pieces of equipment to be analyzed plus five squares which provide for the recording of: (a) "to" or "from" movements, (b) the issuing point of materials (c) the finishing point of the product, (d) a total horizontal check column, and (e) a total vertical check column. For example, if ten pieces of equipment are used to produce an item, there will be fifteen rows of horizontal A-B squares, and fifteen A-C squares. The equipment and other categories on the cross chart are listed in identical sequence on the A-B and A-C axes. (It will be noted that the area for recording movements between pieces of equipment is separated by a heavy vertical line and a heavy horizontal line from the area used for checking the accuracy of the recordings.)

A cross chart for analyzing equipment arrangement has a diagonal line drawn from point A to point D, separating the two lists of the equipment into "to" and "from" fields. By recording the frequencies of movement of material in the appropriate squares, interpretation may be made by studying these frequencies in relation to the diagonal line. The number of squares away from the diagonal indicates the number of machines by-passed in recording any movement of material, whether forward or backward. Frequencies recorded in the squares directly adjacent to the diagonal line show the number of movements between adjacent pieces of equipment. These, also, may be movements forward or backward.

The data in the lower triangular field, A-C-D (the area below the diagonal line), represent the number of progressive movements of material toward the finished stage. The higher the number of frequencies which occur adjacent to the diagonal line, but below it, the higher the degree of efficiency in arrangement of the machines in terms of material handling.

The data recorded in the upper triangular field, A-B-D (the area above the diagonal line), represent the total number of back-tracking movements of material in the succession of processes toward the finished state. The fewer the back-tracking movements in the upper triangular field, the higher the degree of efficiency of the equipment arrangement for material handling.

Cross Charting the Production of Beef Stew

In the study herewith reported, a single menu item was used to demonstrate the use of the cross chart in rearranging equipment to reduce back-tracking and by-passing. The menu item used was beef stew with dumplings, selected because it was: (a) a typical menu item prepared in the average institutional kitchen, and (b) a menu item containing a multiplicity of ingredients and requiring a number of different processes and several different pieces of equipment. The recipe was tabulated for ingredients, processes, process sequence, and equipment needed (Table 1). The ingredients were listed in Column 1. The processes to which each ingredient was subjected were listed in Column 2. A sequence number for identification was given to each process requiring a trip or movement of material, and these numbers were listed in Column 3. The equipment performing the processes was listed in Column 4. This information provided the basis for arranging the data on a cross chart.

Column 4 of Table 1 shows that six pieces of equipment were required. Accordingly, a cross chart

TABLE 1 Tabulation of equipment used in producing 250 6-oz. portions (¾ cup) beef stew and dumplings. Sequence and frequency of use are indicated for plotting on cross chart

INGREDIENT	PROCESS	TRIP SEQUENCE	EQUIPMENT REQUIRED
	Beef Stew		
Boneless beef	obtain from storage (ingredient issue), trim beef	1	table
	weigh 50 lb. beef	2	scale
	cut beef into 1-in. cubes	3	table
	braise the beef	4	steam-jacketed kettle
	add 7½ qt. water, simmer		
Potatoes	peel	5	electric vegetable peeler
	trim and wash	6	sink
	weigh 18 lb. 12 oz. potatoes	7	scales
Carrots	peel	8	electric vegetable peeler
	trim and wash	9	sink
	weigh 18 lb. 12 oz. carrots	10	scales
Celery	trim and wash	11	sink
	weigh 6 lb. 4 oz. celery	12	scales
Onions	trim and wash	13	sink
	weigh 18 lb. 12 oz. onions	14	scales
	place all vegetables in steamer baskets	15	steamer basket, table
	steam all vegetables	16	vegetable steamer
Flour	weigh 3 lb. 12 oz. flour	17	scales
	add flour to meat stew, stir and cook	18	steam-jacketed kettle
Salt Pepper Monosodium glutamate	measure { 1¾ c. 2 tsp. ⅔ c.	19	table
	add seasonings to stew, stir	20	steam-jacketed kettle
	remove vegetables from steamer	21	vegetable steamer
	add steamed vegetables to stewed meat	22	steam-jacketed kettle
	Dumplings		
Flour Baking powder Shortening Dry milk solids	weigh { 12 lb. 13 oz. 2 lb. 10 oz. 1 lb. 4 oz.	23	scales
Salt	measure 1 tsp. salt	24	table
	cut shortening into dry ingredients		
Water	measure 1¼ gal. water	25	sink
	combine water with flour and shortening mixture; dip dumpling batter with No. 30 scoop; place dumplings on greased pans	26	table
	steam dumplings	27	vegetable steamer
	transfer stew into serving pans	28	steam-jacketed kettle
	place pans of stew on table for finishing	29	table
	remove dumplings	30	vegetable steamer
	place dumplings on stew	31	table
	product completed (product out)	32	

(Fig. 2) was drawn consisting of eleven rows of squares on the vertical axis and eleven rows of squares on the horizontal axis. The six pieces of equipment were listed in six of the rows of squares on the A-B axis and in the same order of arrangement on the A-C axis. Each equipment listing was preceded by a row of squares for "Ingredient Issue" and "Product Out," respectively. These two identical lists on the horizontal and vertical axes were separated by the diagonal line (A-D). Thus, fields were provided for showing all of the "to" and "from" movements of material (ingredients) between one piece of equipment and another among the six pieces required for the recipe.

The data of the trip sequences, as shown in the recipe analysis (Table 1), were then plotted on the cross chart. The method of plotting follows:

Trip Sequence No. 1 (meat issued from storage to the table for trimming) was entered as frequency "1" under "Ingredient Issue" of the horizontal listing, in the square opposite "Table" of the vertical listing. This trip is shown by the arrow indication in Figure 2.

Trip Sequence No. 2 (required for the weighing of the beef) was then recorded by entering "2" below "Table" of the horizontal listing, in the square opposite "Scales" of the vertical listing, as shown by the arrow.

Sequence No. 3 (a trip from the scales to the table for cutting the beef into cubes) is indicated by the arrow from "Scales" to "Table."

All trip sequences from Table 1 were plotted on the cross chart (Fig. 2) in this manner. Thus, each number on the cross chart (in the area within the heavy lines) indicates one trip frequency. It also

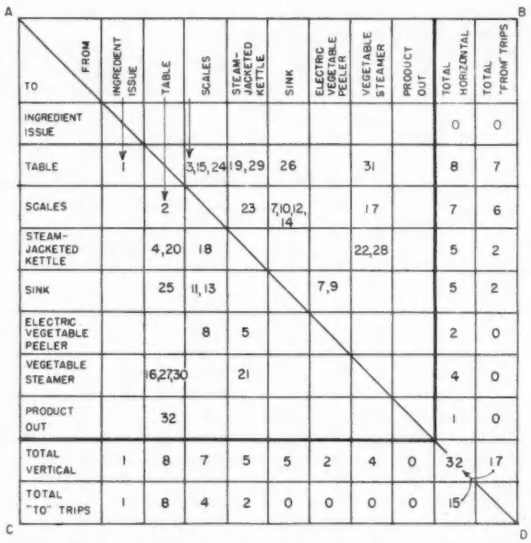

FIG. 2. *Cross chart of equipment layout for analyzing production of beef stew and dumplings.*

indicates the sequence of that trip in the production of the beef stew and dumplings, as listed in the recipe.

Determining Plotting Accuracy

As a check on the accuracy of the plotting, the number of movements shown on the cross chart should total the same amount horizontally and vertically, and this sum should equal the total number of movements required by the recipe for the production of the menu item. The sum of the "to" trips plotted below the diagonal line, added to the sum of the "from" trips plotted above the diagonal line also should equal the total trips for the recipe production.

Thus, in checking the accuracy of the plotting of the cross chart in Figure 2, the column "Total Horizontal" shows that the number of movements required are: 0, 8, 7, 5, 5, 2, 4, and 1; and the "Total Vertical" row shows these movements totalled vertically are: 1, 8, 7, 5, 5, 2, 4, and 0. (It will be noted that these sequences are alike except that the first and last numbers are in reversed order, because of the sequence of "Ingredient Issue" and "Product Out" in recipe production.) The sums of the horizontal and vertical rows are both 32, this being the total movements required to produce beef stew and dumplings.

Checking of the cross chart further shows that 15 "To" trips are plotted below the diagonal line indicated in the "Total 'To' Trips" column; and that 17 "from" trips are plotted above the diagonal line. The sum of the "To" and "From" trips (15 + 17) is 32, the number of trips or material movements for the recipe production.

TABLE 2 Efficiency of layout in Figure 2, indicating method of calculation

UNITS FROM DIAGONAL LINE	TOTAL FREQUENCIES			
	Unweighted		Weighted	
	To	From	To	From
1	3	6	1×3= 3	2×6=12
2	5	6	2×5=10	4×6=24
3	3	3	3×3= 9	6×3=18
4	0	1	4×0= 0	8×1= 8
5	3	1	5×3=15	10×1=10
6	1	0	6×1= 6	12×0= 0
Sub-total..	15	17	43	72
Total...	32		115	
Efficiency*...	46.88%		37.39%	

*Total divided by sub-total of "To" frequencies.

Interpretation of Cross Chart Plotting

The cross chart (Fig. 2) plotted and checked as described, is interpreted by counting the number of "To" movements in each diagonal row *below* the diagonal line and the number of "From" movements in each diagonal row *above* the diagonal line. Movements in the "To" area of the chart plotted in the first diagonal row of squares, that is, the squares adjacent to the diagonal line are totalled and recorded opposite "1" in Column 2 of Table 2, which is the calculation table for the cross chart in Figure 2. Movements plotted in the second diagonal row of squares below the diagonal line are totalled and recorded opposite "2," and so on, consecutively, for all the diagonal rows of squares in the equipment listing of the "To" area of the cross chart. This procedure is repeated for the "From" area. These totals are recorded in Column 3 of Table 2. The total frequencies of the combined "To" and "From" columns divided into the number of forward or "To" frequencies yields a percentage figure which may be interpreted as an efficiency level. Thus, the layout plotted on the cross chart in Figure 2 shows that there are 15 forward or "To" trips in the 32 trips required, indicating that the efficiency of this layout for the production of beef stew and dumplings is 46.88 per cent.

Data summarized from the charts are frequently weighted to emphasize the importance of by-passing and back-tracking as factors which decrease layout efficiency. The amount of the weighting assessed on the data may be arbitrary. Smith (3) weighted "To" frequencies according to the number of pieces by-passed, as shown by the distance that the diagonal rows containing plotted squares are situated below the diagonal line. The "From" frequencies or back-tracking trips he considered to be "twice as bad" as forward trips, and thus, he weighted these frequencies twice the number of pieces by-passed, as shown by the distance that the diagonal rows containing plotted squares are situated above the diag-

onal line. Application of Smith's system is illustrated in Columns 4 and 5 of Table 2. The "To" frequencies in Column 2 are multiplied in single mathematical progression, while the "From" frequencies in Column 3 are multiplied in double mathematical progression. Now the value of the "To" trips is 43 and the "From" trips 72. The total of 115 is now to be divided into 43, yielding a 37.39 per cent efficiency.

Interpretation of the weighted frequencies in Table 2 shows that the penalties assessed for by-passing have lowered the efficiency of the equipment layout in the cross chart (Fig. 2) from 46.88 to 37.39 per cent. This example emphasizes the principle that factors which increase distances are to be avoided or minimized in layout planning.

Increased Efficiency Arrangement

As explained in the description of a cross chart, recordings adjacent to the diagonal line indicate that pieces of equipment adjacent to each other are used in sequence. Where these recordings adjacent to the diagonal line are in squares below it (in the "To" area), movement forward in the sequential use of equipment is denoted. Where the recordings adjacent to the diagonal line are in squares above it (in the "From" area), movement backward in the sequential use of the equipment is denoted. It is desirable to have the equipment arranged so that a maximum number of the plottings of the menu item processes will fall below the diagonal line in the squares adjacent to it. This denotes that a maximum number of the trips required for the recipe production are forward in sequential use of the equipment, while the wasteful back-tracking and by-passing of equipment are reduced to a minimum.

The number of movements between pieces of equipment provides a basis for determining improvement of its arrangement. The highest number occurring between any two pieces of equipment takes priority in the rearrangement. The next highest number occurring between either of these two pieces of equipment and any other piece will take second priority, and so on.

BACK-TRACKING OR "FROM" TRIPS

Consideration will first be given to the back-track trips in determining the priorities to be assigned. Below is a list of the back-tracking trips between pieces of equipment shown in Figure 2.

Sink to scales	4
Scales to table	3
Steam-jacketed kettle to table	2
Vegetable peeler to sink	2
Vegetable steamer to steam-jacketed kettle	2
Steam-jacketed kettle to scales	1
Sink to table	1
Vegetable steamer to table	1
Vegetable steamer to scales	1
Total "From" or back-tracking trips	17

A

TO \ FROM	INGREDIENT ISSUE	ELECTRIC VEGETABLE PEELER	SINK	SCALES	TABLE	STEAM-JACKETED KETTLE	VEGETABLE STEAMER	PRODUCT OUT	TOTAL HORIZONTAL	TOTAL "FROM" TRIPS
INGREDIENT ISSUE									0	0
ELECTRIC VEGETABLE PEELER				8		5			2	2
SINK		6,9		11,13	25				5	3
SCALES			7,10,12 14		2	23	17		7	3
TABLE	1		26	3,5,24		19,29	31		8	3
STEAM-JACKETED KETTLE				18	4,20		22,28		5	2
VEGETABLE STEAMER					16,27 30	21			4	0
PRODUCT OUT					32				1	0
TOTAL VERTICAL	1	2	5	7	8	5	4	0	32	13
TOTAL "TO" TRIPS	1	2	5	4	6	1	0	0	19	

B C D

FIG. 3. *Cross chart of equipment layout for analyzing production of beef stew and dumplings after change in layout to improve flow of work.*

Since the highest number of "From" trips occurred between sink and scales, these two pieces of equipment should be placed adjacent to each other, and since these trips were in the direction from sink to scales, the sink should be placed before the scales in the total equipment arrangement. The next highest frequency to appear between the scales and another piece of equipment will determine the piece of equipment to be placed next to the scales.

Rearrangement in this manner resulted in a sequence of equipment as follows: electric vegetable peeler, sink, scales, table, steam-jacketed kettle, vegetable steamer.

FORWARD OR "TO" TRIPS

The list of forward trips is then studied to determine whether any improvements can be made in the new arrangement which will reduce by-passing trips in the forward movements. Below is a list of the forward trips between pieces of equipment in Figure 2.

Table to vegetable steamer	3
Table to steam-jacketed kettle	2
Scales to sink	2
Table to scales	1
Table to sink	1
Scales to steam-jacketed kettle	1
Scales to electric vegetable peeler	1
Steam-jacketed kettle to electric vegetable peeler	1
Steam-jacketed kettle to vegetable steamer	1
Ingredient issue to table	1
Table to product out	1
Total "To" or forward trips	15

The new arrangement has improved the relationship of the forward movements, also. For example, in Figure 2, four pieces of equipment are by-passed

TABLE 3 Efficiency of revised layout in Figure 3

UNITS FROM DIAGONAL LINE	TOTAL FREQUENCIES			
	Unweighted		Weighted	
	To	From	To	From
1	12	7	12	14
2	5	4	10	16
3	1	1	3	6
4	1	1	4	8
5	0	0	0	0
6	0	0	0	0
Sub-total . . .	19	13	29	44
Total . . .	32		73	
Efficiency* . . .	59.38%		39.73%	

*Total divided by sub-total of "To" frequencies.

for the three forward trips from the table to the vegetable steamer, while in the new arrangement, there is now only one piece of equipment to be by-passed between the table and vegetable steamer. Thus it was considered that no further changes were needed and that the new arrangement of the equipment was ready for cross-chart trial.

This revised sequence of equipment is shown on the new cross chart (Fig. 3). The trips required to make beef stew and dumplings, when plotted on this new cross chart, showed only 13 back-tracking trips compared with 17 in the original layout (Fig. 2). Table 3 shows that the efficiency of the revised arrangement with the frequencies unweighted was 59.38 per cent (a difference of 12.5 per cent), or an improvement of 26.66 per cent.[2] The weighted frequencies, because the movements they represent are now closer to the diagonal line and less equipment is by-passed, total only 73, compared with 115 in the original arrangement. The efficiency yielded by the new arrangement, in terms of weighted frequencies, is 39.73 per cent, a difference of 2.34 per cent, or an improvement of 6.26 per cent.

Additional value may be obtained from cross charts by weighting the frequencies in plotting with such factors essential in layout planning as the distance in feet that materials are moved, time required for the moving, and labor and other costs of material handling.

Mention should also be made that electronic computers for processing cross chart data have been used in some industries where multi-products are manufactured. Such application may well be considered for institutional kitchens which produce a variety of complex menu items.

Conclusions

It is evident that the analysis of one product (menu item) in a multiple-product kitchen is insufficient basis for recommending changes in equipment layout or for planning a new layout. Further study of a variety of products is indicated. However, it can be seen that many products may be plotted on one cross chart for study. The frequencies and direction of movements among pieces of equipment are shown on the chart, and from these data, arrangements may be planned which reduce by-passing and back-tracking trips, as such movements increase distance and thereby increase production costs.

The cross chart should be of value to administrators, dietitians, kitchen architects, engineers, and others as a practical technique in planning efficient layouts and for justifying requests for layout expenditures.

Summary

The problem of planning efficient layouts for institutional kitchens is based on the variety of menu items to be prepared, the number of different processes required, and the varied sequences of these processes. Economic considerations require that a menu item be produced at the lowest possible cost for the quality desired. Layouts which minimize distances that materials must travel in production thereby help minimize costs.

It has been the purpose of this study to demonstrate the use of the "cross chart" as a technique in the planning of efficient layouts. The cross chart provides a method for studying movements of materials in production and determining more efficient arrangement of equipment to reduce back-tracking and by-passing of equipment, as these trips increase distances. One of the chief advantages of a cross chart is that the production trips for a great many items may be shown on one chart.

To illustrate a simplified application of the cross chart for kitchen planning, a single menu item, beef stew and dumplings, was selected for the purpose. The trips required for the processes in the production of the recipe were recorded on a cross chart. Efficiency of the arrangement of equipment was considered to be the relationship of forward trips to total trips. Efficiency was shown to be 46.88 per cent. By weighting the forward trips according to the pieces of equipment by-passed and weighting back-tracking trips by twice the number of pieces by-passed, the efficiency of the equipment arrangement was calculated to be only 37.39 per cent.

To improve the efficiency of the equipment layout, trip frequencies between the various pieces were studied and the equipment rearranged into a sequence whereby back-tracking and by-passing trips would be reduced. A cross chart with the revised sequence of equipment was then plotted. The efficiency of this layout with frequencies unweighted was shown to be 59.38 per cent, an improvement in efficiency of 12.5 per cent by difference, or percentage-wise of 26.66 per cent. The efficiency of the layout with frequencies weighted was 39.73 per cent,

[2]Obtained by dividing the per cent difference by the original per cent efficiency.

or an improvement percentage-wise of 6.26 per cent.

These results show that the cross chart method can serve usefully in the planning of efficient equipment layouts for the varied production requirements of institutional kitchens.

Cited References

(1) AMRINE, H. T., RITCHEY, J. A., AND HULLEY, O. S.: Manufacturing Organization and Management. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1957.

(2) IMMER, J. R.: Layout Planning Techniques. N.Y.: McGraw-Hill Book Co., Inc., 1950.

(3) SMITH, W. P.: Travel charting—first aid for plant layout. J. Indust. Engin. 6: 13, 1955.

Other References

ALFORD, L. P.: Principles of Industrial Management for Engineers. N.Y.: Ronald Press, 1940.

BLOETJES, M. K.: Layouts for food service. Coll. & Univ. Bus. 19: 46 (Aug.) 1955.

CHAPINIS, A., GARNER, W. R., AND MORGAN, C. T.: Applied Experiental Psychology: Human Factors in Engineering Design. N.Y.: John Wiley & Sons, Inc., 1949.

DANA, A. W.: Kitchen Planning for Quantity Food Service. N.Y.: Harper & Bros., 1949.

GULLICKSON, C. D.: Imaginators at work. J. Am. Dietet. A. 32: 651, 1956.

IRESON, W. G.: Factory Planning and Plant Layout. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1952.

LUNDY, J. L.: A reply to Prof. Wayland P. Smith's article, "Travel charting—first aid for plant layout." J. Indust. Engin. 6: 9, 1955.

MUTHER, R.: Practical Plant Layout. N.Y.: McGraw-Hill Book Co., Inc., 1955.

THOMAS, O. M. H.: A Scientific Basis for the Design of Institution Kitchens. N.Y.: Teachers College, Columbia University, 1947.

WEST, B. B., AND WOOD, L.: Food Service in Institutions. 3rd ed. N.Y.: John Wiley & Sons, Inc.. 1955.

BIOGRAPHICAL NOTES FROM THE HISTORY OF NUTRITION
Leopold Gmelin—August 2, 1788–April 4, 1853

Chemists and physiologists have laid a large part of the groundwork for the development of the science of nutrition. The chemists of a century ago were frequently graduates in medicine, and one of the families which, through four generations, produced pioneers in the movement to establish chemistry as a separate science, was the Gmelin family. It was Leopold Gmelin who, along with Tiedemann, did some of the earliest work in the area of physiological chemistry.

Leopold Gmelin was the youngest son of Johann Fredrich Gmelin (1748-1804), Professor of Chemistry and Botany at Gottingen; grandson of Philip Frederick Gmelin (1721-1768), Professor of Medicine at Tubingen; and great grandson of Johann Georg Gmelin, apothecary of Tubingen (1674-1728). Thus, we see he came of a long line of apothecaries, chemists, and students of medicine, and it was natural that Leopold should find his interest in science. Also, the time was ripe for the development of organic chemistry and the investigation of the chemistry of living tissues.

Leopold was born on August 2, 1788, at Gottingen and his early education was in the lyceum in that town. In 1804, he went to Tubingen to work in the family apothecary shop and study mathematics and medicine in the University there. He returned to Gottingen where he obtained his medical degree in 1812, with a dissertation on "The Black Pigment of Steers and Calves Eyes." After a year of analytical work on minerals in Italy and another year in Paris, he was appointed Professor of Chemistry (1817) in the medical faculty at Heidelberg. From 1820 to 1826, he collaborated with Friedrich Tiedemann (1781-1801), who was Professor of Anatomy and Physiology, on some twenty papers in the field of physiological chemistry. Together they studied the chemistry of digestion and of gall and blood; they isolated taurin from ox gall (1824) and hematin from blood. They also isolated pancreatin and cholic acid and discovered potassium thiocyanate in saliva.

Gmelin's fame rests largely on his handbook of theoretical chemistry which first appeared in 1817 as three thin volumes, but which by constant revision and expansion grew to a many-volumed reference work which was *the* book for chemists for over a generation and which exerted a strong influence on the development of chemistry as a science. However, Gmelin did not consider chemical valence of elements to be a prime factor in determining combining weights, and so he had a retarding influence on the advancement of knowledge of atomic chemistry.

With boundless energy and a logical, critical, and inquiring mind, Gmelin worked unceasingly in the field of chemistry. He coined the terms, "ester" and "ketone" as class names. Wohler was a student of Gmelin, and it was he who persuaded Wohler to turn to chemistry instead of practicing obstetrics.

Gmelin suffered a stroke in 1848; he retired from teaching in 1851, and died April 4, 1853.

REFERENCES: Walden, P.: The Gmelin chemical dynasty. Translated by R. E. Oesper. J. Chem. Educ. 31: 534, 1954.—*Contributed by E. Neige Todhunter, Ph.D., Dean, School of Home Economics, University of Alabama, Tuscaloosa.*

Nutrients in Cooked Frozen Vegetables[1]

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RECENTLY A large-scale survey was made to determine nutritive levels of commercial frozen fruit, juice, and vegetable products (1). In an extension of this work, the effect of certain storage conditions on vitamins was determined (2). The purpose of the project discussed in this paper was to determine the retention of nutrients of twenty frozen vegetables during cooking for home serving.

Procedure

Tests were performed on packages drawn from a single case of each product. The contents of each case came from the same batch of raw material of good quality. Control values were determined on composites of six random packages from each case. Cooking was carried out on four to six replicates. For each product, the liquid and solid components, respectively, were composited for assay.

The cooking procedures were selected through preliminary testing to avoid overcooking which impairs flavor and color, as well as nutritive value, of the food product. "Optimum flavor doneness" (minimum cooking compatible with good flavor) was determined subjectively; the cooking treatment required to obtain this state varied to some extent according to type of vegetable, variety, and maturity of the crop when harvested. The general procedure of starting the cooking at high heat[3] and lowering the heat once boiling is attained is commonly recommended by home economists and by packers of frozen vegetables.

The products, except for French fried potatoes, were cooked in aluminum 2-qt. saucepans, 7 in. in internal diameter, 3 in. in height, and with tight-fitting lids. Details of cooking procedures are given in Table 1. The distilled water was measured into the saucepans and the frozen vegetables were placed in the pans at the time indicated in the footnote for Table 1. If the vegetables were in block form, they were placed icy side down; the size of the pan allowed the entire bottom surface of the block to come in contact with the pan. The water was brought to or kept boiling at high heat and subsequently the heat was adjusted as indicated in Table 1. Total cooking times include brief periods during which the covers were off to allow reversing the block or stirring. Immediately after cooking, the liquid and solid phases were separated on a sieve by pouring all replicates over a standard 12-in., 8-mesh screen and draining for 2 min. Ascorbic acid assays were carried out at once, and the other determinations were made within a few days on sample material held under refrigeration.

French fried potatoes were baked on ungreased cookie sheets in ovens in which the thermostats had been calibrated against thermocouple temperature readings. They were baked for 15 min. at 425°F.

For illustrative purposes, leaf spinach was subjected to cooking for various periods with three different levels of added water. The general cooking procedure was similar to that described for this product above and in Table 1. The "underdone" and "overdone" total cooking times were 25 per cent shorter and 25 per cent longer, respectively, than the time for "optimum flavor doneness."

The assay methods employed have been described previously (1). The "total ascorbic acid" values reported include reduced ascorbic acid and dehydroascorbic acids.

Percentage retention was calculated by dividing the total amount of nutrient in the cooked solids or liquid for each product by the total amount of nutrient in the original sample and multiplying by 100.

Results and Discussion

The total amounts of solids and liquor, respectively, recovered for each product are recorded in Table 2. Levels of nutrients in control samples and percent-

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[2]The assistance of H. P. Schmitt and Carol Best, National Association of Frozen Food Packers, in carrying out this work is gratefully acknowledged.

[3]The modern gas burners used in this study were calibrated and adjusted for standard and uniform performance by the local public utility.

TABLE 1 **Cookery procedures for minimum doneness of frozen vegetables**

FROZEN VEGETABLE	COOKING TIME				COOKING WATER	PACKAGE SIZE	REPLICATE COOKINGS
	Full heat	Medium heat	Simmer	Total			
	min.	*min.*	*min.*	*min.*	*cups*	*oz.*	
Asparagus spears	4*	0	4	8	¼	10	6
Beans, green							
Cut	4†	6*	1	11	¼	10	6
French style	4†	6*	1	11	¼	10	6
Beans, Lima							
Baby	6*†	2	1	9	½	10	6
Fordhook‡	4*	4*	1	9	½	10	6
Broccoli							
Chopped	4†	5*	1	10	¼	10	6
Spears#	4*	0	4	8	¼	10	4
Brussels sprouts	6*	0	4	10	¼	10	6
Cauliflower	4*	2	1	7	¼	10	6
Collard greens, sliced	4†	6*	1	11	¼	10	6
Corn, cut#	5*	0	1	6	¼	10	4
Mixed vegetables‡	3*	2*	2	7	¼	10	6
Okra, whole baby	6*	0	1	7	¼	10	6
Peas							
Black-eyed	6*	2	2	10	⅜	10	6
Green#	6*	0	2	8	¼	10	4
Peas and carrots‡	3*	2*	2	7	¼	10	6
Spinach							
Chopped	4†	6*	1	11	¼	12	6
Leaf#	4†	6*	1	11	¼	12	4
Turnip greens, chopped	4†	6*	2	12	¼	10	6

*Vegetable stirred briefly during cooking.
†Block of frozen vegetable reversed during cooking.
‡Loose frozen product.
#Cooked by placing in boiling distilled water. All other vegetables were placed in distilled water at room temperature before cooking started. (Baking of French fried potatoes is described in the text.)

age retention of each nutrient in the cooked solids and cooking liquor are given in Table 3. Minerals were not determined in okra and black-eyed peas because of insufficient sample.

It is apparent that with the cooking procedures employed for "optimum flavor doneness" there is little leaching (in most cases less than 10 per cent) of any of the nutrients into the liquor. In products showing relatively low over-all recovery of ascorbic acid, it is impossible to state whether the destruction took place in the solid or liquid phase, but it should be noted that for the eight products showing more than 85 per cent over-all recovery of ascorbic acid, only 6 to 15 per cent of the original ascorbic acid was found in the liquid phase. Turnip greens showed the greatest leaching effect, with from 15 to

TABLE 2 **Weight records for cooking frozen vegetables**

FROZEN VEGETABLE	ADDED WATER	SAMPLE	DRAINED COOKED SOLIDS	COOKING LIQUOR
	gm.	*gm.*	*gm.*	*gm.*
Asparagus spears	354	1691	1636	284
Beans, green				
Cut	354	1696	1508	195
French style	354	1703	1477	195
Beans, Lima				
Baby	708	1700	1688	258
Fordhook	708	1798	1803	401
Broccoli, chopped	354	1694	1500	251
Brussels sprouts	354	1670	1676	209
Cauliflower	354	1719	1632	280
Collard greens, sliced	354	1737	1521	236
Mixed vegetables	354	1722	1697	278
Okra, whole baby	354	1668	1538	153
Peas, black-eyed	354	1763	1636	146
Peas and carrots	354	1721	1742	255
Potatoes, French fried (baked)	—	1552	1277	—
Spinach, chopped	354	2044	1940	183
Turnip greens, chopped	354	1727	1339	411

TABLE 3 **Nutrients in control samples of frozen vegetables and percentage retention in cooked solids and liquor**

FOODSTUFF	Asparagus spears	Cut green beans	French Style green beans	Baby Lima beans	Fordhook Lima beans	Chopped broccoli	Broccoli spears	Brussels sprouts	Cauli-flower	Sliced collard greens	Cut corn	Mixed vegetables	Okra	Black-eyed peas	Green peas	Peas and carrots	French-fried potatoes	Chopped spinach	Leaf spinach	Turnip greens
Proximate Composition																				
Moisture																				
Control value (gm./100 gm.)	91.77	91.76	92.28	72.81	75.81	92.78	89.33	87.27	92.13	89.37	79.44	83.75	89.83	67.72	81.28	85.40	69.27	89.35	90.64	92.11
Solids																				
Retention in drained solids (%)	94	62	101	97	98	89	93	92	84	95	96	111	103	100	98	95	105	108	118	90
Retention in cooking liquor (%)	3	5	4	0	3	5	6	2	4	5	—	3	3	1	7	3	—	3	6	5
Ash																				
Control value (gm./100 gm.)	0.63	0.35	0.35	1.14	1.01	0.63	0.69	0.76	0.55	1.14	0.48	0.68	0.81	0.89	0.89	0.55	0.55	1.18	1.27	0.53
Retention in drained solids (%)	117	51	136	94	94	93	99	135	95	103	101	83	90	96	86	105	105	113	99	133
Retention in cooking liquor (%)	8	7	12	10	11	13	11	5	9	13	—	3	5	6	12	1	—	7	7	23
Ether extract—control value (gm./100 gm.)	0.05	0.01	0.03	0.20	0.29	0.18	0.19	0.07	0.05	0.22	0.43	0.12	0.06	0.39	0.18	0.20	5.57	0.35	0.21	0.15
Protein																				
Control value (gm./100 gm.)	3.15	1.84	1.86	7.00	7.12	2.09	4.03	3.82	2.17	3.44	2.71	3.12	1.91	8.12	6.03	3.71	2.55	4.41	3.88	2.62
Retention in drained solids (%)	104	104	95	91	82	117	98	98	94	108	98	101	118	97	92	97	102	106	120	90
Retention in cooking liquor (%)	4	4	6	2	3	12	4	3	4	5	—	3	3	1	5	3	—	2	2	3
Crude fiber																				
Control value (gm./100 gm.)	0.90	0.87	1.17	1.97	1.76	1.28	0.89	1.29	0.92	1.06	0.30	1.19	1.23	1.75	1.46	1.58	0.67	1.00	0.60	1.28
Retention in drained solids (%)	104	148	105	90	97	82	127	103	106	107	228	102	100	105	114	97	97	96	144	93
Retention in cooking liquor (%)	5	2	2	2	3	2	2	1	3	4	—	2	1	1	1	2	—	2	1	2
Total carbohydrates																				
Control value (gm./100 gm.)	0.90	5.07	4.31	16.88	14.01	3.04	4.87	6.79	4.18	4.77	16.64	11.14	6.16	21.13	10.16	8.56	21.39	3.71	3.40	3.26
Retention in drained solids (%)	77	28	101	101	106	74	82	78	71	80	94	106	101	101	100	95	108	120	112	85
Retention in cooking liquor (%)	2	5	4	2	2	3	9	0	3	3	—	3	2	1	9	3	—	3	12	4
Minerals																				
Calcium																				
Control value (mg./100 gm.)	20.1	38.3	37.1	31.9	26.4	74.3	54.9	21.0	16.9	179.0	3.9	28.0	—	—	19.9	25.9	4.6	106.4	100.8	135.9
Retention in drained solids (%)	90	94	99	95	90	96	96	97	92	93	88	102	—	—	94	96	91	105	100	81
Retention in cooking liquor (%)	6	4	4	9	12	7	4	4	7	8	5	4	—	—	5	3	—	0	0	10
Iron																				
Control value (mg./100 gm.)	0.70	0.68	0.83	2.65	1.52	0.90	1.20	0.76	0.61	1.32	0.84	1.03	—	—	2.13	1.07	0.63	6.55	3.70	1.97
Retention in drained solids (%)	87	145	93	88	99	69	62	109	89	117	63	92	—	—	79	97	98	91	88	93
Retention in cooking liquor (%)	9	9	3	6	10	4	4	6	5	7	4	6	—	—	4	5	—	1	—	6
Phosphorus																				
Control value (mg./100 gm.)	75.3	30.0	24.0	108.7	75.0	40.3	68.4	64.0	37.1	58.8	63.3	58.8	—	—	85.2	62.5	46.0	56.3	61.7	43.7
Retention in drained solids (%)	95	98	111	99	102	103	92	98	106	105	91	103	—	—	103	99	105	105	101	90
Retention in cooking liquor (%)	3	4	5	4	6	5	4	3	3	3	6	4	—	—	5	3	—	3	—	5
Magnesium																				
Control value (mg./100 gm.)	14.6	21.7	17.4	48.5	41.5	17.4	20.5	21.0	11.9	46.5	19.3	24.5	—	—	22.0	20.3	20.3	87.6	81.0	29.4
Retention in drained solids (%)	83	90	102	92	87	94	91	96	91	94	91	98	—	—	92	93	90	86	95	79
Retention in cooking liquor (%)	9	7	9	13	18	13	10	5	13	12	9	5	—	—	7	7	—	3	4	14
Potassium																				
Control value (mg./100 gm.)	280	162	149	472	434	209	262	335	202	308	201	226	—	—	167	200	440	470	414	185
Retention in drained solids (%)	92	97	96	97	93	93	86	96	99	66	90	92	—	—	90	95	100	96	97	74
Retention in cooking liquor (%)	8	9	11	10	13	12	10	6	8	9	9	8	—	—	10	8	—	6	—	21
Sodium																				
Control value (mg./100 gm.)	1.4	0.8	2.0	36.0	3.1	8.0	9.1	19.0	13.9	19.0	0.5	45.5	—	—	172	19.0	1.4	4.5	14.6	13.4
Retention in drained solids (%)	103	89	78	90	97	83	75	89	100	87	88	88	—	—	87	88	106	95	94	69
Retention in cooking liquor (%)	25	15	14	12	22	13	9	6	8	10	15	10	—	—	11	9	—	8	—	24

Vitamins																							
Total ascorbic acid																							
Control value (mg./100 gm.)	24.9	10.1	0.1	6.8	10.6	36.2	84.4	68.4	52.5	83.2	8.8	5.7	18.4	11.1	17.0	11.1	0.3	32.3	45.3	39.7			
Retention in drained solids (%)	91	51	72	65	75	79	81	93	73	49	45	99	79	72	83	78	41	66	79	57			
Retention in cooking liquor (%)	10	5	12	17	15	15	12	5	10	12	7	6	8	9	0	4	—	7	9	22			
Beta-carotene																							
Control value (mg./100 gm.)	0.46	0.21	0.24	0.16	0.19	1.34	1.22	0.22	<0.01	3.80	0.03	2.54	0.38	0.30	0.42	6.04	0.01	6.40	5.50	4.30			
Retention in drained solids (%)	114	140	137	99	132	106	99	160	0	111	89	99	90	74	85	59	165	142	101	93			
Retention in cooking liquor (%)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	—	0	0	0			
Folic acid																							
Control value (mg./100 gm.)	0.029	0.023	0.023	0.031	0.026	0.024	0.026	0.058	0.032	0.074	0.017	0.022	0.035	0.048	0.015	0.032	0.008	0.043	0.059	0.057			
Retention in drained solids (%)	74	81	83	77	85	74	75	88	50	64	44	67	84	87	110	57	93	97	99	80			
Retention in cooking liquor (%)	16	16	16	16	22	11	26	8	14	12	7	13	6	11	16	7	—	8	6	24			
Niacin																							
Control value (mg./100 gm.)	1.25	0.55	0.36	1.34	1.15	0.32	0.73	0.57	0.46	0.78	1.40	1.10	0.96	1.48	2.20	1.49	1.58	0.62	0.60	0.45			
Retention in drained solids (%)	81	74	81	77	77	91	86	92	85	88	100	127	104	100	101	111	113	96	104	79			
Retention in cooking liquor (%)	10	9	18	6	12	18	14	5	13	13	10	5	5	1	14	6	—	9	10	25			
Pantothenic acid																							
Control value (mg./100 gm.)	0.40	0.20	0.20	0.20	0.20	0.33	0.76	0.54	0.80	0.49	0.54	0.28	0.24	0.32	0.43	0.26	0.56	0.15	0.25	0.15			
Retention in drained solids (%)	79	65	62	89	89	86	68	72	69	85	60	92	82	82	66	85	103	74	64	70			
Retention in cooking liquor (%)	8	7	7	12	17	14	11	5	10	13	6	8	8	10	10	10	—	6	5	18			
Riboflavin																							
Control value (mg./100 gm.)	0.190	0.125	0.085	0.063	0.066	0.076	0.113	0.116	0.057	0.190	0.062	0.063	0.116	0.096	0.094	0.082	0.024	0.182	0.188	0.107			
Retention in drained solids (%)	85	86	88	83	81	89	78	92	84	98	93	96	81	70	104	88	88	107	102	85			
Retention in cooking liquor (%)	9	7	11	10	14	10	12	4	11	10	11	7	4	5	15	5	—	9	11	16			
Thiamine																							
Control value (mg./100 gm.)	0.28	0.07	0.05	0.07	0.11	0.04	0.12	0.12	0.09	0.07	0.11	0.10	0.14	0.20	0.44	0.20	0.12	0.11	0.13	0.06			
Retention in drained solids (%)	90	102	87	85	73	111	86	84	74	100	80	99	99	135	88	122	96	78	82	78			
Retention in cooking liquor (%)	7	7	12	15	10	15	11	8	9	10	7	8	4	12	8	5	—	8	5	16			
Vitamin B_6																							
Control value (mg./100 gm.)	0.184	0.084	0.076	0.118	0.139	0.080	0.141	0.199	0.210	0.245	0.178	0.102	0.057	0.111	0.129	0.113	0.236	0.327	0.109	0.156			
Retention in drained solids (%)	58	73	56	74	70	94	74	81	64	76	61	100	95	96	67	79	87	61	74	56			
Retention in cooking liquor (%)	6	7	7	6	7	15	10	5	8	9	6	6	4	6	17	5	—	4	12	16			

25 per cent of the original amounts of all the vitamins except beta-carotene appearing in the liquor. Intermediate leaching effects were observed with broccoli, Lima beans, collard greens, and green peas. There was little leaching of the minerals and proximate components; in most cases less than 10 per cent of these nutrients appeared in the liquor. Sodium was leached most readily with 10 to 25 per cent appearing in the liquor for most of the products.

The results in Table 4 illustrate: (a) the tendency toward more leaching of ascorbic acid when more cooking water was used, and (b) lowered over-all retention of ascorbic acid when more cooking water was used and cooking time extended.

It is considered good practice to utilize the nutrients in the liquor by serving with the vegetables or by using the liquor in preparing soups, sauces, or gravies.

There was generally good over-all retention of the vitamins, which are of particular interest because of the well known lability of some of the more important vitamins, especially ascorbic acid and thiamine, to heat treatment. Considering package-to-package variation and normal experimental error, one could consider that there was essentially no destruction of thiamine by the cooking procedures employed. Products which showed 90 per cent or better, or essentially complete, over-all retention of total ascorbic acid included asparagus spears, Lima beans, broccoli, mixed vegetables, and green peas. The lowest over-all retentions were in cut green beans (57 per cent), sliced collard greens (61 per cent), cut corn (52 per cent), and chopped spinach (73 per cent). The fact that these products were cut may partially explain this lower retention of ascorbic acid.

As might be expected, niacin and riboflavin were quite resistant to the heat treatment. There were scattered instances of 15 to 50 per cent lower retention of beta-carotene, folic acid, pantothenic acid, and vitamin B_6. These nutrients are known to be moderately sensitive to cooking treatments. Actually, considering the vitamins other than ascorbic acid, only the following products showed less than 80 per cent recovery of more than one of the vitamins tested: French-style green beans, cauliflower, cut corn, black-eyed peas, and peas and carrots.

Although one would expect approximately 100 per cent recovery of proximate and mineral components, in some cases there was a definite deviation from this. These exceptions may have been due in part to package-to-package variation, but were probably due mainly to large errors, percentagewise, in determining some of the components present at low levels. Retentions of ether extract are not reported because of the low levels of this factor.

Although a number of studies on retention of nutrients in cooking of frozen vegetables have been reported, it is difficult to make detailed comparisons because of variation in cooking procedures. However, the retentions reported here are in general agreement with the literature in this field which has been reviewed recently by Tressler and Evers (3) and which indicates that good retention of nutrients

TABLE 4 Percentage retention of total ascorbic acid in leaf spinach under various cooking conditions

AMOUNT OF WATER ADDED	ASCORBIC ACID RETENTION		
	Drained cooked solids	Cooking liquor	Total
	"Underdone" Spinach		
	%	%	%
¼ cup	70	12	82
½ cup	58	13	71
1 cup	51	24	75
	"Optimum Flavor" Doneness		
¼ cup	65	6	71
½ cup	45	13	58
1 cup	35	18	53
	"Overdone" Spinach		
¼ cup	55	2	57
½ cup	40	7	47
1 cup	34	13	47

*General cooking conditions are described in the text and in Table 1.

can be attained if frozen vegetables are cooked in a minimum amount of water and if overcooking is avoided. Vitamin losses in cooking of frozen vegetables tend to be minimized because blanching prior to freezing inactivates certain destructive enzymes and because the products have been pre-cooked to a degree in the blanching process. A number of workers have reported (4-6) on the increased leaching as more water is used in cooking, particularly as the volume is raised from a minimum amount to enough to cover the vegetable. Although the rate of loss of ascorbic acid tends to decrease as ordinary cooking of vegetables proceeds, overcooking causes definitely lowered retention if it continues appreciably beyond cooking to doneness; holding of cooked vegetables at elevated temperatures before serving also results in lowered retention of ascorbic acid (7).

Summary

Twenty frozen vegetable products were subjected to cooking procedures which involved the use of minimal amounts of water and cooking to subjectively determined "optimum flavor doneness." There was little leaching of nutrients into the liquor except for 10 to 25 per cent of the sodium in most of the products and 15 to 25 per cent of all the vitamins except beta-carotene in turnip greens. Considering over-all (solids plus liquor) recovery, there was essentially complete retention of thiamine, niacin, and riboflavin. There were scattered instances of lowered retention of beta-carotene, folic acid, pantothenic acid, and vitamin B_6 to a maximum of 50 per cent. There was better than 90 per cent retention of ascorbic acid in a number of products. The lowest retentions of ascorbic acid (52 to 73 per cent) were in cut green beans, sliced collard greens, cut corn, and chopped spinach.

References

(1) Burger, M., Hein, L. W., Teply, L. J., Derse, P. H., and Krieger, C. H.: Vitamin, mineral, and proximate composition of frozen fruits, juices, and vegetables. J. Agric. & Food Chem. 4: 418, 1956.

(2) Derse, P. H., and Teply, L. J.: Effect of storage conditions on nutrients in some frozen fruit, juice and vegetable products. J. Agric. & Food Chem. 6: 309, 1958.

(3) Tressler, D. K., and Evers, C. F.: The Freezing Preservation of Foods. Vol. 1. Fresh Foods. 2nd ed. Westport, Conn.: Avi Publishing Co., 1957.

(4) Oser, B. L., Melnick, D., and Oser, M.: Influence of cooking procedure upon retention of vitamins and minerals in vegetables. Food Research 8: 115, 1943.

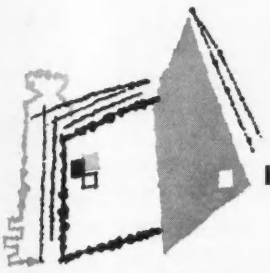
(5) Van Duyne, F. O., Chase, J. T., Fanska, J. R., and Simpson, J. I.: Effect of certain home practices on reduced ascorbic acid content of peas, rhubarb, snap beans, soybeans, and spinach. Food Research 12: 439, 1947.

(6) Krehl, W. A., and Winters, R. W.: Effect of cooking methods on retention of vitamins and minerals in vegetables. J. Am. Dietet. A. 26: 966, 1950.

(7) Crosby, M. W., Fickle, B. E., Andreassen, E. G., Fenton, F., Harris, K. W., and Burgoin, A. M.: Vitamin retention and palatability of certain fresh and frozen vegetables in large-scale food service. Cornell Univ. Agric. Exper. Sta. Bull. 891, 1953.

The Doctor's Role in Reducing

The acceptance of responsibility to reduce weight needs to be a joint decision: the doctor wants to help and the patient wants to reduce. They must both be sincerely honest in this wanting. The helping is by participation. The fulcrum must be the doctor-patient relationship, the interest in the problem, the optimism of the doctor, the interest in the patient as a total person, and the readiness to spend time helping, sustaining, and listening. The "busy" doctor can do more harm than good. Too often diet and instruction are hurriedly given by way of a printed or mimeographed form, often by the nurse or receptionist. In the clinic, it may be the dietitian. The return visit shows no improvement. The patient is therefore scolded. There are too many patients waiting and perhaps the doctor had enough troubles of his own without listening and learning about the patient's personal situation and anxieties. This kind of atmosphere is practically calculated to increase obesity, if not to lose patients.—*Excerpted from "Diet Is Controllable" by A. J. Simon. Bull. Ill. Dietet. A. 22: 3 (fall), 1957.*



BOOK REVIEWS

A New Approach to the Integration of Nutritive Therapy and Dietary Clinical Experience in the Nursing Curriculum. By Thelma J. Wayler and Charlotte A. Stump. Brooklyn: Long Island College Hospital School of Nursing, 1958. Paper. Pp. 42. Price $1.50.

This small handbook describes the underlying philosophy and the methods used at Long Island College Hospital School of Nursing to integrate experience in nutrition and diet therapy into the nursing care of patients on medicine, surgery, obstetrics, and pediatrics. The experience is preceded by 6 hr. of nutrition given during the orientation program, described in detail, and by 45 hr. of class work in nutrition and diet therapy. No content or outline is given for the latter. Class hours also precede the experience on obstetrics and pediatrics. An outline for a nutrition care study and an evaluation form conclude the booklet.

Although a considerable amount of material is included, it is unfortunately not very clearly presented. Nursing education today finds itself in a great era of experimentation and change. A booklet such as this is needed by teaching dietitians involved in some of the newer methods of integrating nutrition into the total nursing care of the patient. It is hoped that in another edition the authors will expand and clarify the content of this booklet and thereby increase its usefulness.—*Henderika J. Rynbergen, Associate Professor of Science, Cornell University—New York Hospital School of Nursing, New York, New York.*

The Well-Fed Bridegroom. By Margaret Williams. Garden City, New York: Doubleday and Co., Inc., 1957. Cloth. Pp. 172. Price $3.

The Well-Fed Bridegroom is exactly what the title implies—a book devoted to excellent meals for two. It presupposes little knowledge of a kitchen, and none at all of cooking, and it should sell like the proverbial hotcakes to those seeking wedding presents.

To readers of this JOURNAL, however, it will also have wide appeal. The menus—thirty-one of them—are complete and cosmopolitan. The author lives in New Orleans, and it is reflected in her writing. To anyone in the world of food preparation, this does not imply criticism! Beneath each menu are listed the steps necessary to prepare and serve it, in the order in which they are done, and with comments both useful and amusing. The first half of the book consists of food terms, defined; lists and descriptions of kitchen equipment; sections on spices, breakfast preparations, and marketing lists; and instructions on the care of a kitchen. The author believes that good wine should accompany good food, a viewpoint shared by this reviewer.

If a new bride followed this book for a month, she would then be a good, if not accomplished, cook. If a career girl took this book and fed its marvelous meals to a suitable young man, I think she might complete the month with a "Well Fed Bridegroom" of her own!—*Virginia Monahan Bayles, Houston.*

The Low-Fat Way to Health and Longer Life. By Lester M. Morrison, M. D., Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1958. Cloth. Pp. 212. Price $4.95.

An explanation of the causes of atherosclerosis as viewed by Dr. Morrison is detailed, and the entire aging process of the arteries is explained as he sees it. Concern regarding the seriousness of the condition is somewhat allayed by the hope offered in the form of a nutritional program which combines a low-fat, low-cholesterol diet with various "supplements."

In one chapter the author describes the various kinds and amounts of nutrients and supplements which are needed; fat is relegated to the bottom of the list. In fact, one chapter is entitled "Fat, the Killer, on Trial." This chapter deals with obesity and its relation to heart disease.

Dr. Morrison's suggested diet is basically a low-fat program as commonly used in many low caloric programs. In addition, lecithin, soya bean oil, liver extract, brewer's yeast, and various vitamin supplements are recommended. Each of these, he contends, plays an invaluable role in the prevention or possible reversal of atherosclerosis.

If this plan is followed, the author states that years may be added to life. He cites many examples of patients who have benefited greatly by it. These examples in particular will serve to "convert" many readers. Some, however, will feel that the claims are exaggerated. Even those who are dubious may conclude that the plan might do more good than harm and the least it can do is form better eating habits.

Chapters on smoking and alcohol contain much common-sense advice which could be taken by many. A chapter on "Care After a Heart Attack" will give confidence to anyone who has suffered one.

While Dr. Morrison presents his information convincingly, the many unanswered questions which still remain regarding the correlation of diet with forms of heart disease, will detract from a full acceptance. This dogmatic opinion, at best, would seem premature. Even though the author's ideas could conceivably some day be facts, at the present time, most authorities are awaiting more convincing proof. Every theory will contribute something to the eventual solution to the problem.—*Lt. JG Martha J. Svete, MSC, USNR, U. S. Naval Hospital, San Diego.*

RECENT BOOKS RECEIVED

Ear, Nose and Throat Dysfunctions Due to Deficiencies and Imbalances. By Sam E. Roberts, M.D. Springfield, Ill.: Charles C Thomas, 1957. Imitation leather. Pp. 323. Price $8.50.

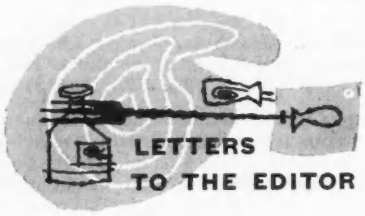
Ten Million and One. Neurological Disability as a National Problem. New York: Paul B. Hoeber, Inc., Harper & Brothers, 1957. Cloth. Pp. 102. Price $3.50.

Report of the Commission of Inquiry on the Fluoridation of Public Water Supplies. Wellington, New Zealand: R. E. Owen, government printer, 1957. Paper. Pp. 240. Price 8s.

The Chronically Ill. By Joseph Fox, Ph.D. New York: Philosophical Library, Inc., 1957. Cloth. Pp. 229. Price $3.95.

Care of the Premature Infant. By Evelyn C. Lundeen and Ralph H. Kunstadter, M.D., F.A.C.P., F.A.A.P. Philadelphia: J. B. Lippincott Company, 1958. Cloth. Pp. 367. Price $8.

A History of Public Health. By George Rosen, M.D., Ph.D., M.P.H. New York: MD Publications, Inc., 1958. Cloth. Pp. 551. Price $5.75.



Sodium in Fish Sold in the Midwest

TO THE EDITOR:

In regard to the article, "Sodium and Potassium Content of 34 Species of Fish" by Claude E. Thurston in the April issue of the JOURNAL, the question arises as to the procedure used in handling the salt-water fish from the time they are caught until they are available on the retail market in the Midwest. Is salt added in the bath on the boat, or in the ice used in shipping, and so on? How much of a difference does this make? — *Clara Karl, University of Chicago Clinics, Chicago.*

AUTHOR'S REPLY:

All of the fresh-water fish reported in the JOURNAL were obtained in the Midwestern states and shipped to us in (fresh water) ice. Delivery time was about four days. They did not come in contact with brine or salt. There would be some leaching of sodium and potassium during this four-day period. It would be slight for sodium and probably not more than 10 per cent for potassium.

The salt-water fish were obtained direct from the fishing vessels within 24 hr. of capture, without storage in brine or treatment with salt, except the sole, which were obtained in the Seattle fish market. Due to the high sodium content, I felt sure they had been in contact with brine. We have obtained fresh samples of dover, sand, petrale, and English sole. Analyses on English sole have been completed, and the sodium ranged from 49 to 84 mg. per 100 gm. for ten fish, with an average of 64 mg. compared with the value of 91 mg. given in the JOURNAL in April.

We have carried out experiments on the variation in ash and metal ion content of fish flesh when stored in ice and refrigerated brine. Three papers will appear within the next year on these studies. The first was presented at the San Francisco meeting of the American Chemical Society in April.

The results indicate that there is a gradual loss (10 to 20 per cent) in ash, a large loss (30 to 60 per cent) in potassium, and a fluctuation of 10 per cent in sodium when the fish are stored in ice for periods up to three weeks. When fish are stored in refrigerated brine for periods of three to twenty days, the ash shows a gain of as much as 100 per cent, the sodium a gain of up to 15-fold, and the potassium a loss of up to 60 per cent. This may not be an actual loss, since the gain in ash is due to the sodium, and the potassium would have to be less on a percentage basis.

We also stored some samples in ice for one week after they had been in brine for a week. The sodium gained up to 9-fold in the brine and lost half of the total sodium content on storage in ice. This left it about five times as high as the normal content of the flesh when fresh.

Bibliography on Administration

TO THE EDITOR:

I have been working here since October and am most happy with the hospital and the work. This is a new field for me in dietetics. At times, I feel my lack of experience in administration very keenly. Consequently, I wonder if I might call on you for help with some of our problems in food purchasing, inventory control, and cost accounting. I would greatly appreciate any help you can give.— *Margaret M. Hartney, La Rabida Jackson Park Sanitarium, Chicago.*

EDITOR'S NOTE:

Similar requests are frequently received in the JOURNAL office and by other departments of the Headquarters staff. To help answer such inquiries, a bibliography covering articles on these subjects was published in the July issue of the JOURNAL, page 746.

Diet Manuals

TO THE EDITOR:

Our diet manual was revised the last time in 1954. As our department is being enlarged considerably to take care of more patients in a new wing of our hospital, we feel that a complete revision of our diet manual should be made soon. We would like to be "up to date in '58" in our terminology and ideas. Could you help us by referring us to a bibliography of material on this matter?—Mary J. Smallwood, Therapeutic Dietitian, Ingalls Memorial Hospital, Harvey, Illinois.

EDITOR'S NOTE: The reports of the committees of the Diet Therapy Section of The American Dietetic Association which developed the "Glossary of Dietetic Terms" are reviewed in the September 1957 issue of the JOURNAL, under the title, "Is Your Diet Manual Up to Date?" The definitions of the diets developed by these committees appear in the "Revised Glossary of Dietetic Terms" in the 1952 edition of the *Handbook of Diet Therapy.* Further revisions will be incorporated in the third edition now being prepared.

Other materials which might also be helpful to you in preparing your manual are the following features which have appeared in the JOURNAL:

"Standardized Diets?"—May 1956, page 454.

"More on Form Diets"—July 1956, page 657.

"The Controversy on Form Diets Continues"—September 1956, page 842.

"Developing New Diet Manuals" by Lorraine Weng — October 1954, page 1003.

"A Guide for the Preparation of Diet Manuals" by Doris Johnson—October 1954, page 1010.

Diet Therapy Section Project No. 2, 1952-53

The American Dietetic Association

Problems of Cost Accounting

TO THE EDITOR:

I have read carefully three of the articles in the May issue of the JOURNAL: "Role of Records in Reducing Costs" by Murray Rappaport; "Precosting Food" by C. Carroll Weaver; and "Precosting Labor" by Grace L. Stumpf. I find them very helpful, especially in formulating plans, as a consultant, to help the dietary departments in small hospitals.

I have these questions, suggestions, and criticisms to make:

(a) Even though the article, "Role of Records in Reducing Costs" is good, it is slanted toward commercial institutions rather than the hospital.

(b) How can a hospital set up a daily profit-and-loss statement when the dietary department does not know the daily income? (I realize the value of a daily profit-and-loss statement, having used a very good system in another position.)

(c) How high is high for china and glassware breakage? I have made several inquiries to other hospitals and find that they just don't have records of replacement costs in the dietary department. I kept a record for a year in one hospital, but did not find any records with which I could compare our figures. What percentage of dietary costs should be considered normal for replacements?

(d) The articles on precosting food and labor are very good. I like the method of using the total hours of direct labor as a means of determining the required minutes per patient meal as a basis for labor analysis. Time studies are necessary to find the wasted motion and good work loads.

By precosting menus and using tally sheets, the dietitian can keep close touch on daily food costs, but most hospitals—especially small ones—do not have the skilled persons or the time to work out these records. What is the answer?

I would like to challenge someone to answer the questions posed on profit and loss statement and on the relative cost of china replacement.— *Anna Katherine Jernigan, Dietary Consultant, Iowa State Department of Health, Des Moines.*

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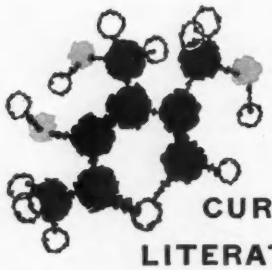

CURRENT LITERATURE

Contributed by Janette C. Carlsen, The Johns Hopkins Hospital, Baltimore; Clara Karl, University of Chicago Clinics; Elizabeth Tuft, Chicago Wesley Memorial Hospital; and the Journal staff.

THE AMERICAN JOURNAL OF CLINICAL NUTRITION

Vol. 6, May-June, 1958

*Symposium on the mode of action of lipotropic factors in nutrition.—pp. 197-331.

Mode of Action of Lipotropic Factors. This issue is composed of papers presented at a symposium held at the Graduate School of Public Health of the University of Pittsburgh. The symposium was planned to embody a dual progression: from enzymology to physiology—and from animal to man. Jacob A. Stekol discusses the biosynthesis of labile methyl groups, transmethylation and the biosynthesis of choline. Eugene P. Kennedy deals with the enzymatic synthesis of phospholipid from choline. Camillo Artom reviews the evidence that lipotropic factors play a role in the oxidation of fatty acids, while D. B. Zilversmit and N. R. DiLuzio present data on the role of lipotropic factors in the turnover of phospholipids. In animal nutrition, A. E. Harper discusses dietary factors which influence liver fat deposition in the rat, and Ibert C. Wells presents effects in the animal of antimetabolites on the lipotropic factors. Wendell H. Griffith reviews his work on the renal lesion in choline deficiency, and George F. Wilgram discusses the role of the lipotropic factors in maintaining the integrity of the heart and vascular tree in the rat. With a jump from the experimental to the clinical situation, Silvester Frenk and co-workers discuss kwashiorkor and marasmus in children, and George J. Gabuzda fatty liver in adults. In conclusion, Robert E. Olson *et al.* and Thaddeus D. Labecki give evidence which ascribes a role to these lipotropic factors in controlling the blood lipids in man. Of special interest is the effect of low-protein diets on serum cholesterol in man. Studies in man have shown that reducing dietary protein and choline without altering dietary fat or calories causes hypocholesterolemia and hypo-B-lipoproteinemia. These studies support the central role of the liver in fat transport and show that dietary protein and choline may influence not only liver fat content but also the concentration of the serum lipids and lipoproteins in rat, dog, monkey, and man. Whether diets low in animal protein tend to protect adult human populations from atherosclerosis by virtue of a defect in fat transport is not clear.

AMERICAN JOURNAL OF MEDICINE

Vol. 24, May, 1958

*Pathogenesis and management of hepatic coma. S. Sherlock.—p. 805.

Treatment of Hepatic Coma. In treating hepatic coma, all dietary protein is stopped. At least 1600 calories are supplied daily as glucose drinks or as 20 per cent glucose through an intragastric drip. Twenty or 40 per cent dextrose is given intravenously through plastic tubing introduced via an antecubital vein into the innominate vein or superior vena cava. During recovery, protein is added in 20-gm. increments on alternate days. The protein is divided between four meals. Any relapse is treated by return to the former regimen. In patients with an acute episode of coma, a normal protein intake is soon achieved. In the chronic group, permanent protein restriction is needed to correct mental symptoms. The limits of tolerance are usually 40 to 50 gm. per day. In this group, an exacerbation of symptoms is treated by rest and abstention from protein. In the acute cases, a few days to a few weeks of deprivation of protein does not prove harmful, and even in the chronic group in which dietary protein has been restricted for many months, clinical protein malnutrition is not seen. In patients with liver disease, nitrogenous equilibrium can be maintained on a severely reduced intake of protein, and the risk of temporary nitrogen depletion is preferable to the hazards of nitrogen toxicity. This measure is only indicated in patients who show signs of coma. Other patients with liver disease benefit by high-protein feeding, particularly if ascites is forming. Supplements of vitamin K and the B-complex are given parenterally.

AMERICAN JOURNAL OF PUBLIC HEALTH

Vol. 48, May, 1958

*Preventive medicine aspects of flight feeding. A. A. Taylor and B. Finkelstein.—p. 604.

Flight Feeding. The U.S. Air Force is concerned with the influence of nutrition on qualitative work performance, accidents, and the general well-being of its people. This paper outlines the role of food during flight as it relates to preventive medicine. Flight feeding involves all of the intricacies of feeding on the ground plus the added limitations imposed by the type of aircraft, the length of flight, the decreased atmospheric pressure, and the hazards entailed in flying. Two new means of meeting current inflight feeding needs are described. These include the Foil Pack Inflight Feeding System, which provides freshly cooked, hot meals for crews and passengers on patrol, transport, and cargo aircraft, and the Compact Box Lunch, which was designed for use in combat jet aircraft. Foods for use in fighter aircraft are currently being developed.

ANNALS OF BIOCHEMISTRY AND EXPERIMENTAL MEDICINE (India)

Vol. 17, No. 6, 1957

*Studies on the mechanism of blood coagulation by proteolytic enzymes. I. Effect of calcium on the clotting and proteolytic activities of papain and trypsin. G. Chatterjee, N. K. Sarkar, and R. Banerjee.—p. 179.

*Studies on the mechanism of blood coagulation by proteolytic enzymes. II. Optimum *p*H for the proteolytic and clotting activities of papain and trypsin. G. Chatterjee, N. K. Sarkar, and R. Banerjee.—p. 183.

Mechanism of Blood Coagulation by Proteolytic Enzymes. This study investigated the proteolytic and the clotting activities of trypsin and papain in relation to the effect of calcium ion. Decalcified trypsin can coagulate decalcified rabbit plasma in the absence of calcium, though its presence greatly increases the clotting activity of trypsin. Decalcified papain cannot at all coagulate decalcified rabbit plasma without the addition of calcium ion. The calcium ion has no effect as far as the proteolysis of decalcified plasma by decalcified papain or decalcified trypsin is concerned.

Optimum pH for the Proteolytic and Clotting Activities. Hydrogen ion concentration has an important bearing on the velocity of reaction catalyzed by an enzyme, and each enzyme system has its own optimum *p*H where it can function best. Since trypsin and papain can coagulate blood in addition to their proteolytic activity, their *p*H optima for both these activities were studied to elucidate the mechanism of clotting activity by proteolytic enzymes. Decalcified trypsin and decalcified papain coagulated decalcified plasma optimally at *p*H 6.1 and 6.3, respectively. The *p*H optima for the proteolysis of decalcified plasma by decalcified trypsin and by decalcified papain were correspondingly 8.04 and 5.6. The *p*H optima for the clotting and for the proteolysis by either papain or trypsin are different.

BRITISH MEDICAL JOURNAL

No. 5078, May 3, 1958

*Some effects of sodium salicylate on muscle metabolism. K. L. Manchester, P. J. Randle, and G. H. Smith.—p. 1028.

Salicylate and Muscle Metabolism. Sodium salicylate, like insulin, increases the uptake of glucose by isolated rat diaphragm and enables the non-utilizable sugar D-xylose to enter the muscle cells. Neither insulin nor sodium salicylate enables free glucose to accumulate within the cells of isolated diaphragm, presumably because the potential rate of glucose utilization within the cell exceeds the rate of entry of glucose into the cell. The effect of insulin on isolated diaphragm differs from that of salicylate

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in that salicylate promotes loss of potassium and diminishes incorporation of ^{14}C-labeled amino acids into the protein, whereas insulin does not promote potassium loss and increases incorporation of labeled amino acids into protein. The uptake of glucose into the cells of isolated diaphragm appears to be restrained by an active process, dependent on the oxidative production of energy-rich phosphate. It is suggested that salicylate promotes uptake of glucose by inhibiting the production of energy-rich phosphate and that insulin promotes glucose uptake, more specifically, by limiting the availability of energy-rich phosphate to a process concerned with regulating the entry of glucose into the cell. It is suggested that the antidiabetic action of salicylate results, at least in part, from its effect in increasing the utilization of glucose by muscle.

CANADIAN MEDICAL ASSOCIATION JOURNAL

Vol. 78, May 15, 1958

*Dietary treatment of phenylketonuria. R. Gibson.—p. 788.

Dietary Treatment of Phenylketonuria. In phenylketonuria rapid progressive and severe intellectual deterioration occurs. Affected children are normal at birth, but signs of mental deficiency generally appear at about six months of age, and by twelve months, the idiot level may have been reached. There now seems little doubt that this is due to intoxication by phenylalanine or one of its metabolites. A diet is accomplished by reducing the intake of cow's milk with compensatory increase of casein hydrolysate (charcoal treated) and the addition of methionine. In earlier cases the intake of phenylalanine, in the form of milk protein, was reduced until phenylpyruvic acid was no longer detectable in the urine. This still kept abnormally high levels of phenylalanine in the blood and urine. The daily intake of cow's milk was reduced until these levels were the same as in normal children. In every instance, diet was controlled by repeated chemical investigation of blood and urine. The age at the beginning of this diet varied from five weeks to five years. Almost every case showed a sharp rise in intelligence quotient after treatment was started. The younger the child and the less marked the initial deterioration, the greater was the likelihood of improvement. For these reasons it is strongly recommended that every phenylketonuric child be treated early. It is also advocated that the urine of all children should be tested at the age of twenty-one days and treatment commenced immediately if the reaction is positive.

CHRONICLE OF THE WORLD HEALTH ORGANIZATION

Vol. 12, April, 1958

*Food and drug problems in the Americas: a co-operative approach.—p. 126.

Drug Problems in Americas. Countries must have efficient food and drug services backed by appropriate legislation if they are to derive full benefit from the information and recommendations given by the Food and Agriculture Organization of the United Nations (FAO). Organizations like FAO and WHO (World Health Organization) have made recommendations and suggestions for the organization of a national drug control service, and have outlined the principles to be followed in introducing new pharmaceutical products. Studies undertaken in the Americas to determine the best methods whereby an inter-American agency for the control of drugs might be organized were referred to by this international agency. The Pan American Sanitary Board believes that a careful and thorough survey of food and drug problems in each country is prerequisite to international action. Such a survey will be carried out. Activities for eventual consideration by the board include: establishment of a clearing-house, financed by participating countries to provide information on food and drug laws; review and analysis of current legal requirements on the export, import, manufacture and supply of drugs, foods, therapeutic devices, and so on; development of legislative standards on the registration of drugs, for recommendation to governments; development of recommended standards of safety, purity, quality, and so on, of food and drugs; provision of advice and assistance in developing national programs; training programs for national personnel; and laboratory services for the development of standard testing methods.

FOOD AND NUTRITION NOTES AND REVIEWS

Vol. 15, January and February, 1958

*Fat metabolism. A symposium on the clinical and biochemical aspects of fat utilization in health and disease. V. P. Najjar.—p. 3.
*Dietary methodology. Comparison of seven-day dietary record and 24-hour recall methods. R. M. Peel.—p. 9.

Fat Metabolism. This article is composed of points of interest from papers presented at a symposium on fat metabolism. These papers have been published in book form. Various phases of obesity are discussed, such as the multiple causative factors, the interaction of some of these factors, and clinical aspects of obese children. Lipemia, synthesis of fats, and fat utilization in health and in disease are explained.

Dietary Record vs. Recall. It was recently reported by workers in the North East Region of the U.S. that for estimation of the dietary intake of groups of not less than fifty, calculation of nutrients from a 24-hr. recall and a seven-day record gave comparable results. This author carried out a similar study in Australia. She concluded that the two methods of collection of dietaries resulted in data which were remarkably similar. Thus it seems possible that when an estimate of the mean intake of a group is desired, the shorter, more expedient 24-hr. recall may be used. This would save time both in collection of data and in their calculation and analysis. Also, it is believed that a more representative sampling of the population could be obtained, as less of the participants' time and cooperation is required.

FOOD RESEARCH

Vol. 23, January-February, 1958

*Effect of xanthophyll on the palatability and fat stability of fresh and frozen broad-breasted bronze turkeys. B. L. Lewis, D. L. Harrison, and P. E. Sanford.—p. 7.
*The effects of oven temperature on certain characteristics of baked salmon. H. Charley and G. E. Goertz.—p. 17.
*Effect of certain ion combinations commonly found in potable water on rate of filtration through roasted and ground coffee. D. G. Gardner.—p. 76.
*Roasting of frozen stuffed turkeys. I. Survival of *Salmonella pullorum* in inoculated stuffing. R. E. Rogers and M. F. Gunderson.—p. 87.
*Roasting of frozen stuffed turkeys. II. Survival of *Micrococcus pyogenes* var. *aureus* in inoculated stuffing. R. E. Rogers and M. F. Gunderson.—p. 96.
*Effect of non-antiscorbutic reducing substances upon the ascorbic acid content of baked potatoes. J. W. McAffee and J. H. Watts.—p. 114.

Xanthophyll on Fresh and Frozen Turkey. Turkeys fed a basic type ration plus 1 per cent xanthophyll concentrate for 6 and 12 weeks before slaughter were compared with turkeys fed only a basic ration. Data were collected for fresh turkey and after 4, 8, 12, and 16 months of frozen storage. There were no significant differences in cooking losses, juices, and aroma of the turkey, in shear values of muscle, or in the acid numbers and peroxide values for fat in the drippings from roasted birds that could be attributed to xanthophyll in the ration. The differences in the flavor and tenderness scores for the birds on the two rations were not significant. Frozen storage adversely affected the aroma, flavor, tenderness, and juiciness scores for the turkeys, but the decline in juiciness and tenderness scores with storage was not linear.

Oven Temperature in Baking Salmon. This paper reports the effects of oven temperature on large pieces of baked Chinook salmon. The cuts were baked at four oven temperatures to a fixed internal temperature. Evaporation, drip, and total cooking losses were determined; press fluid determinations were made on cooked salmon; the baked fish were rated for palatability; and the raw and cooked samples from each cut were studied histologically. Results are given. The cut from the third quarter was ranked highest for flavor and over-all desirability, that from the head end lowest.

Water Filtration Through Ground Coffee. The effect of water composition on preparation time of coffee in a percolation system was investigated. Most of the ions in many water supplies changed the brewing time only slightly. However, carbonate or bicar-

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bonate ions increase this time significantly and in direct relation to their concentration. This effect is accentuated by sodium ions if water, containing temporary hardness and softened in a zeolite conditioner, is used. Water, classified as permanently hard, whether treated or not, had little effect on preparation time. Time of contact between coffee grounds and water is one of the most important factors affecting beverage quality. Water containing a high concentration of bicarbonate and excessive sodium due to zeolite treatment favors over-extraction and unacceptability. To avoid this possibility, types of water treatment other than sodium exchange materials should be used if water conditioning is necessary.

Salmonella in Frozen Stuffed Turkeys. The survival of *Salmonella pullorum* in the stuffing during the roasting of frozen stuffed turkeys was investigated. A temperature of 160°F. must be reached in the center of the stuffing to assure adequate destruction of *Salmonella pullorum*. To allow a modest margin of safety, a minimum temperature of 165°F. is desirable. The roasting process should not be interrupted until the lethal temperature is reached in the center of the stuffing. Present recommended roasting procedures designating hours of cooking time or which stipulate a thigh or breast temperature do not appear adequate bacteriologically. An accurate measurement of the temperature at the center of the stuffing, in conjunction with an attractive doneness, is a much safer criterion.

Micrococcus in Frozen Stuffed Turkeys. The survival of *Micrococcus pyogenes* var. *aureus* in the stuffing of frozen turkeys was investigated. A minimum temperature of 165°F. must be reached in the center of the stuffing during the roasting period to assure adequate destruction of *Micrococcus pyogenus* var. *aureus*. This allows little margin of safety.

Ascorbic Acid Content of Baked Potatoes. The effect of baking on the true ascorbic acid content of potatoes, both sweet and white, was studied. It was observed that there is a decrease in ascorbic acid at the beginning of the baking period and thereafter, an increase. Dehydration at high temperatures, which occurs during baking, might be the causative factor in the formation of non-antiscorbutic reducing substances. Data obtained by three different methods emphasize the importance of having a suitable method for making ascorbic acid analyses.

JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY

Vol. 6, May, 1958

*Lysine supplementation of a breakfast cereal and milk combination. R. Thiessen, Jr., and G. H. Reussner, Jr.—p. 368.

*The nutritive value of fresh and roasted California-grown nonpareil almonds. A. P. Hall, J. G. Moore, B. Gunning, and B. B. Cook.—p. 377.

*Determination of water-holding capacity of fresh meats. E. Wierbicki and F. E. Deatherage.—p. 387.

Lysine Supplementation of Cereal. Cereal proteins in such sources as wheat flour and bread have been improved considerably in protein quality with supplements of synthetic lysine. This investigation was made to determine whether a positive growth response would be obtained from the addition of 0.5 per cent DL-lysine hydrochloride to a wheat flakes breakfast cereal, with and without the milk used in a customary serving. A four-week rat-feeding test indicated that the lysine supplement gave a growth response when wheat flakes were fed without milk. No significant increases in growth or protein efficiency were noted with milk.

Nutrients in Nuts. The effect of blanching and of dry-oven and oil roasting on the proximate composition, protein quality, calcium, phosphorus, iron, thiamine, riboflavin, niacin, pantothenic acid, pyridoxine, folic acid, and biotin in California almonds of the nonpareil variety was determined. The removal of skins by blanching produced significant change in calcium and iron, which appear in greater amounts in the skin. Dry-oven roasting resulted in 69 per cent loss of thiamine and 23 per cent loss of pantothenic acid. There were additional losses of 15 per cent thiamine and 19 per cent pantothenic acid due to oil roasting. There was insignificant change in the other vitamins as a result of either type of roasting.

Water Content of Meats. The water-holding capacity of non-disintegrated muscles and ground and comminuted fresh lean meats was determined on fresh and heated meat. The method used is described. The amount of free water in beef, pork, veal, and lamb varies from 30 to 50 per cent of the total moisture content, depending on the kind of meat and period of aging.

JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 167, May 10, 1958

*Metabolic demands as a factor in weight control. H. Pollack, C. F. Consolazio, and G. J. Isaac. Council on Foods and Nutrition.—p. 216.

*Tolerance of fats in hepatic diseases. Foreign Letters.–Netherlands.—p. 246.

*Infected eggs. Foreign Letters.–United Kingdom.—p. 247.

Vol. 167, May 31, 1958

*Hemoglobin level and red blood cell count findings in normal women. H. E. Judy and N. B. Price.—p. 563.

*Awarding of research fellowships in clinical nutrition. Council on Foods and Nutrition.—p. 580.

*Food poisoning from potatoes. Foreign Letters.–United Kingdom.—p. 651.

*Animal and vegetable fats. Questions and Answers.—p. 673.

*Egg shells as a source of calcium. Questions and Answers.—p. 673.

Metabolic Demands and Weight Control. The basic cause of obesity is an intake of calories in excess of the needs of the body. Obesity may result from an increased intake of calories in the presence of a constant output of energy, from a decreased output in the presence of a constant intake, or from any relative variation of the two. The caloric expenditure per square meter of body surface for any activity can be figured. A table is presented with various daily living activities and sports. The differences in caloric expenditure between lying down, sitting, and standing quietly do not appear large, but when multiplied by the total minutes during the day, they loom large. Using a standard typewriter instead of an electric typewriter or using a standard steering wheel instead of power steering could be the difference between staying thin and gaining weight. The importance of the caloric expenditure factor in the development of moderate obesity in the adult should not be minimized.

Tolerance of Fats in Hepatic Diseases. The subjective tolerance and the absorption rate of fats—butter, margarine, and olive oil—were investigated in patients with various hepatic diseases. Except for one patient, none had any trouble after the ingestion of up to 100 gm. of one of these fats. There appeared to be no decrease in the absorption of these fats in patients with uncomplicated cholelithiasis or in those with hepatitis as soon as the color of the stools returned to normal. Malabsorption was seen in patients with biliary obstruction, biliary fistula, and cirrhosis with obvious icterus, and in those in the early stages of hepatitis when the stools were still clay-colored. Even in total obstruction of the biliary tract, about 50 per cent of the fat ingested was absorbed. These studies did not include all types of fats and fatty acids. It seems justified from this investigation to give most patients with hepatic disease a diet containing up to 100 gm. butter, margarine, or olive oil.

Infected Eggs. Attention is again drawn to the dangers of infection from using imported processed egg. Large quantities of spray-dried and liquid egg are imported from China, Holland, and Australia. Of 20,000 samples analyzed, 5 to 29 per cent were found to be infected with pathogenic species of Salmonella. Salmonella is not present in hens or ducks and can only occur in egg products as a result of human contamination. The frequency of human salmonellosis has doubled in Great Britain in the last few years. This might be reduced by the pasteurizing of egg products at the source or before distribution, as is done in Poland, where infection from processed egg is unknown.

Hemoglobin Level and Red Blood Cell Count. Consecutive case reports were analyzed to obtain an adequate sampling so that a statistical determination of red blood cell counts and hemoglobin levels in normal women could be made. A sampling of 663 charts from 7300 consecutive case records showed the mean or average

in the peptic ulcer diet...

"orange juice several times daily" *

affords protection against vitamin C deficiency without untoward effects on ulcer healing

*

Strub, Talso, and ValDez, in studying gastric response to orange juice, find that when patients with active duodenal ulcers are given 4 oz. orange juice "several times daily" along with "the usual forms of medical management, no prolongation in the healing is noted." (J.A.M.A. 163:1602, 1957)

red blood cell count to be 4,370,000 per cubic millimeter, with a range between 3,810,000 and 5,030,000. The mean hemoglobin level was 12.55 gm. per 100 cc. with a range of 10.2 to 14.8 gm. These are both significantly lower than the standards quoted as normal by hematologists and textbooks.

Fellowships in Clinical Nutrition. Ten fellowships for research in clinical nutrition have been awarded by the Nutrition Foundation, Inc., and the Council on Foods and Nutrition. A fellowship is granted to a medical student to permit him to carry on research in some phase of clinical nutrition during the non-academic portion of the school year. A list of the 1958 fellowships is given. This fellowship program is an effort to stimulate staff members and students of medical schools to take a more active interest in the science of nutrition as an integral part of medical practice.

Food Poisoning from Potatoes. Although potatoes have rarely been found to be a cause of food poisoning, an outbreak of staphylococcic food poisoning was traced to potatoes infected after cooking. French-fried potatoes had been prepared by an infected cook. Tests showed that although cooking potatoes destroys any contaminating staphylococci, they may readily become infected afterwards. Another possibility was that heat-stable staphylococcus enterotoxin formed in infected potatoes during preparation.

Animal and Vegetable Fats. More than 99 per cent of the fats used in the manufacture of margarine come from vegetable sources, with cottonseed oil and soybean oil being used in 94 per cent of the margarine. Vegetable fat shortenings may be of the compound, blended, or all-hydrogenated variety. Examination of the label should tell what type of product is being purchased. While the specific vegetable oil will not be listed, it will be indicated as to whether it is entirely from vegetable sources.

Egg Shells as a Source of Calcium. Egg shell is largely composed of calcium carbonate, with magnesium and other metals in smaller quantities. Calcium carbonate is almost entirely converted into soluble calcium salts in the digestive tract. Egg shells processed through a food blender would serve as an excellent source of dietary calcium, but they may not be the cleanest food in the world.

JOURNAL OF AVIATION MEDICINE

Vol. 29, March, 1958

*Preventive medicine aspects of flight feeding. A. A. Taylor.—p. 206.

Preventive Medicine Aspects of Flight Feeding. During flight, improper food intake, together with anxiety, irritation, fatigue, monotony, drowsiness, and discomfort, decrease flying safety and increase accident hazards. These physical and psychologic stresses are aggravated by sudden changes in barometric pressure, rapid temperature fluctuations, abnormal oxygen tension, turbulence, vibration, restrictive clothing and protective equipment, and cramped position. Aircraft environmental conditions may affect the palatability of food and the desire for it and create dietary dissatisfactions which adversely affect morale. Appropriate food and drink tend to relieve boredom, ease tension, soothe irritation, and counteract stress. Proper flight nutrition, therefore, is best obtained by consuming frequent, light feedings of appropriate foods. Fluid intake is also important in maintaining peak efficiency of aircrews. Drinking fluids needs to be encouraged to alleviate dehydration. Safeguards against food-borne infections and intoxication have been instituted. A bacteriologic study of foil-packed meals established that they may be safely consumed up to five days after preparation when stored at ordinary refrigerator temperatures of 35°F. In high performance aircraft, facilities for eating are especially critical and at times unavailable. Men must be fed when little or no space or weight allowances are available for food service equipment, storage of food, or serving of food. In extreme cases, these restricted conditions are almost prohibitive. Specialized foods and feeding techniques are now being developed. A compact box lunch has been developed for consumption on the B-47 and similar aircraft.

JOURNAL OF BIOLOGICAL CHEMISTRY

Vol. 231, March, 1958

*The free amino acid pool of cultured human cells. K. A. Piez and H. Eagle.—p. 533.

Intracellular Amino Acids. The total cell protein and the free amino acid pool of several human cell strains have been examined by ion exchange chromatography. The cell lines used were strain HeLa, derived from uterine carcinoma; a variant of HeLa strain which arose spontaneously; and two cultures derived from normal liver and conjunctiva. The amino acid composition of the total cell protein was the same for all cell lines. The free amino acids and related compounds of the intracellular pool did not differ significantly among the several strains, and the general pattern was similar to that of other mammalian tissues *in vivo*. The major ninhydrin-reacting components were taurine, glutamine, glutathione, glutamic acid, and ammonia. Smaller amounts of most of the other expected amino acids were present. When growth was prevented by the omission of several essential amino acids from an otherwise complete medium, the free amino acid pool did not change significantly except for the loss of the missing amino acids. Analysis of the medium in which the cells had grown showed that the essential amino acids, supplied in the medium, were concentrated 5- to 11-fold, except for cystine, which could not be detected free in the cells, and lysine and arginine which were concentrated two or three times. The non-essential amino acids, not supplied in the medium, in general had much higher distribution ratios. The exceptions were ammonia and ornithine which were only slightly concentrated, and urea which had a distribution ratio of one.

THE JOURNAL OF NUTRITION

Vol. 64, March, 1958

*Tryptophan-niacin relationships in pregnancy. A. W. Wertz, M. E. Lojkin, B. S. Bouchard, and M. B. Derby.—p. 339.

*Nutrition status survey of the sixth grade school population of Cuba. N. Jolliffe, R. S. Goodhart, M. Archer, H. Lopez, and F. G. Diaz.—p. 355.

*Effect of altitude and diet on hematopoiesis and serum cholesterol. I. R. Payne.—p. 433.

*Human utilization of dehydroascorbic acid. J. H. Sabry, K. H. Fisher, and M. L. Dodds.—p. 457.

*Comparative measurements of ascorbic acid and total ascorbic acid of blood plasma. J. H. Sabry and M. L. Dodds.—p. 467.

Tryptophan - Niacin Relationships. The effect of tryptophan supplementation on the urinary excretion of free and total tryptophan and niacin metabolites has been reported for a group of women in the pregnant and in the nonpregnant state. In pregnancy, the increase in the excretion of niacin metabolites after the usual diet was supplemented with tryptophan was higher than in the postpartum period. The excretion of free tryptophan decreased significantly. These data support the view that the conversion of tryptophan to niacin is more efficient in the pregnant than in the nonpregnant state.

Survey of Cuban School Children. A study of the nutritional status of the population of Cuba was made by examining over two thousand sixth grade school children in all parts of the island. Deficiencies of protein, vitamin A, and ascorbic acid were practically non-existent. Only 4.0 per cent had hemoglobin levels under 11 gm. per 100 ml. of blood, indicating that iron, folic acid, or vitamin B_{12} deficiencies are minor. The proportion who were underweight would seem to indicate that about a third of the public school group is not receiving sufficient nutrients to maintain normal weight. Riboflavin deficiency, either as active angular stomatitis or nasolabial seborrhea, was the most common clinical nutrient deficiency. Although there was a high prevalence of subclinical thiamine and niacin deficiency, as measured by urinary excretion, there was no clinical evidence of either beriberi or pellagra. It appears that vitamin enrichment of a staple article of food, such as rice, would be valuable.

Diet, Altitude, and Cholesterol. Biochemical and physical data on Wyoming women residing at an altitude of 7200 ft. were obtained and compared with a similar study of California women. The total mean value for serum cholesterol was higher in the

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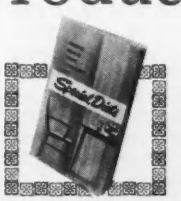

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Wyoming women. They consumed a larger percentage of total fat in the form of animal fat, and more than twice the percentage of them were overweight than in the California survey. The hematocrits, sedimentation rates, and hemoglobins of the Wyoming women were greater than those of the California women. The results of this study indicate that altitude does have an effect on the factors considered. The theory is proposed that increase in hemoglobin, coinciding with increase in red cell count which occurs at high altitude, is accompanied by an increase in degenerate "ghost" cells which contribute cholesterol to the serum. It is suggested that the increase in serum cholesterol which occurs with increasing age may be due to hematopoietic changes which occur with age and which resemble those changes found with increase in altitude.

Utilization of Dehydroascorbic Acid. In an investigation designed to compare the utilization of dehydroascorbic acid with that of ascorbic acid, twelve young men consumed two levels of intakes, 75 and 110 mg. per day during two experiments. Although it was concluded on the basis of urinary returns that dehydroascorbic acid was less well utilized than was ascorbic acid, the extent of utilization of dehydroascorbic acid sufficiently approached that of ascorbic acid at both levels of intake for the maintenance of comparable blood plasma levels of ascorbic acid on both forms of intake.

Comparison of Ascorbic Acid Methods. A comparison was made of micro determinations of ascorbic and total ascorbic acid contents of non-hemolyzed samples of plasma. The measurement of total ascorbic acid averaged 0.18 mg. per 100 ml. higher than that of ascorbic acid in the same plasma. While the higher values for total than for ascorbic acid are not considered to be conclusive evidence for the presence of dehydroascorbic acid in circulating blood, they do indicate that a correction should be applied if direct comparisons are desired between values for plasma ascorbic acid and levels of the vitamin reported as total ascorbic acid.

JOURNAL OF PEDIATRICS

Vol. 52, May, 1958

*Growth and development. III. Skin color in Negro infants and parents: Its relationship to birth weight, reflex maturity, socioeconomic status, length of gestation and parity. C. P. Horton and E. P. Crump.—p. 547.

Growth, Development, and Skin Color. There are some areas in which specific relationships can be observed between skin color and other factors among Negroes. The greater proportion of dark Negroes are in the lower socio-economic groups. About four times as many "dark" mothers are unmarried as are "light" mothers. A definite relationship appears to exist between birth weight and mother's skin color, with lighter mothers tending to have heavier babies. The length of gestation period and parity have no clear relationship with the mother's skin color. There apparently is no consistent relationship between the skin color and weight of the infant at birth. Negroes of light color are generally associated with higher socioeconomic status, which is in turn associated with such factors as heavier birth weights and longer gestation periods.

THE LANCET

No. 7027, May 3, 1958

*Effect of cortisone on development of diabetic acidosis. N. Kalant.—p. 925.

No. 7028, May 10, 1958

*The oral treatment of pernicious anemia. A new approach. J. G. Heathcote and F. S. Mooney.—p. 982.

*Dietary restriction and coagulability of the blood in ischemic heart-disease. L. McDonald and M. Edgill.—p. 996.

Cortisone in Diabetic Acidosis. Cortisone was administered to eight diabetic patients during a 24-hr. period of withdrawal of insulin and food, to determine its effect on the development of ketoacidosis. The steroid produced increased glycemia, insulin resistance, and tissue catabolism, but did not increase ketonemia or decrease the carbon dioxide-combining power. It is concluded that cortical steroids do not contribute significantly to the development of diabetic ketoacidosis.

Oral Treatment of Pernicious Anemia. A brief outline is given of existing theories of the cause and treatment of pernicious anemia. Some of these have been responsible for the pursuit of intrinsic factor preparations of high molecular weight which have not proved especially efficacious. No hypothesis so far has been able to explain completely and satisfactorily the mode of transport of vitamin B_{12} into the blood stream. A new hypothesis is put forward that the orally active form of this vitamin is a peptide complex. Such a vitamin B_{12}-peptide has been isolated by fermenting streptomyces, and it has been shown clinically to be the most effective oral preparation yet available. It is postulated that this active complex could be produced in the stomach by simple proteolysis and that the intrinsic factor probably does not exist.

Dietary Restriction and Coagulability of the Blood. Coagulability of the blood was studied in thirty-four patients with ischemic heart disease, before and after half of them had been maintained on a rice-and-fruit diet four to five weeks. A statistically significant decrease in platelet-stickiness was found after the diet, together with a statistically significant decrease in serum cholesterol and other changes. No significant difference was found in thromboplastin generation, fibrinogen estimation, and prothrombin time.

NEW YORK STATE JOURNAL OF MEDICINE

Vol. 58, May 1, 1958

*Blood levels of vitamin B_{12}. L. D. Wright.—p. 1545.

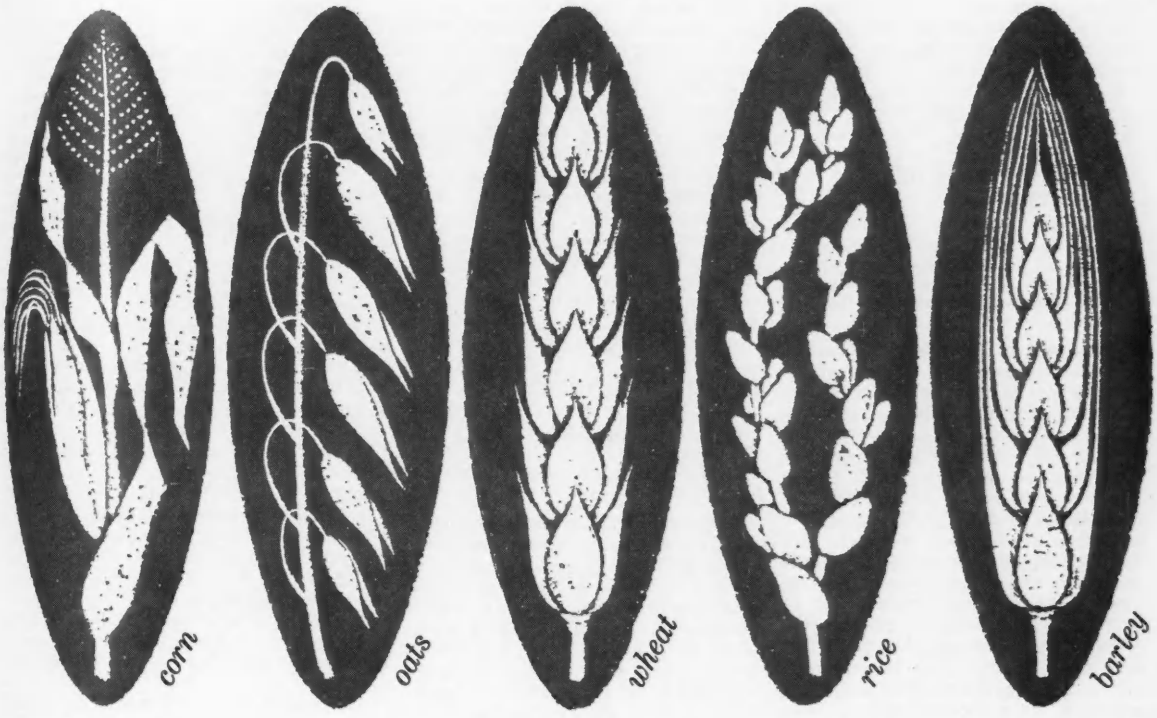
Vitamin B_{12} Blood Levels. Vitamin B_{12} is spectacularly effective in the treatment of pernicious and certain macrocytic anemias. The vitamin similarly is useful as the "animal protein factor" in promoting growth in animals fed relatively inexpensive "vegetable-type" rations. An established method for determining the status of an individual with respect to a given vitamin or other dietary essential is to determine his blood level of the vitamin and compare it with that of a large number of normal individuals. In the case of vitamin B_{12}, blood (whole blood, plasma, or serum) levels are determined microbiologically. In 528 individuals from a large mental hospital, the average blood level was 560 mg. per milliliter. The individuals studied were normal as far as physical health was concerned, and the major variable was age. A statistically significant trend toward lower serum concentrations of vitamin B_{12} with increased age was observed. There was also evidence that vitamin B_{12} blood level falls off during pregnancy and that the newborn infant has a high blood level at the expense of the mother. Questions as to whether vitamin B_{12} should be routinely administered to pregnant women in an attempt to maintain prepregnant or "normal" blood levels of the vitamin remain unanswered. Those individuals who restrict their diets entirely to vegetable products also show a progressive decrease in vitamin B_{12} over a period of years. Eventually a deficiency of the vitamin ensues that may be fatal unless corrective measures are taken.

NURSING OUTLOOK

Vol. 6, May, 1958

*How should the textbook be used? A. W. Spieseke.—p. 276.

Getting the Most out of Textbooks. The author gives ten rules for getting the most out of textbooks. (1) Read the introduction, preface, or foreword with care. (2) Read rapidly any assignment to gain an over-all picture. (3) Use the table of contents or index to locate subjects that are not completely understood in any oral presentation by the instructor. (4) Underline in the text unfamiliar words of the special vocabulary. (5) Relate class explanations of particular themes or subjects to the text material. (6) Reflect and think about the main ideas presented in the text and discuss them with other students. (7) Make logical, written outlines of important developments or topics, using only key words to stand for main and subordinate points. (8) Use such outlines to recall mentally the full accounts. (9) Fix main ideas, developments, relationships, processes, and interpretations in mind by deliberately recalling them



the calories in the cereal and milk serving are well balanced and low in fat

In the light of the modern trend toward less fat in the diet and for quick and lasting energy foods, the calories in the cereal and milk serving merit consideration. Both the cereal and the milk contribute well-balanced nourishment.

This serving provides quick and lasting energy, is *low in fat*, and is a good source of many nutrients as shown in the table below. It furnishes about 10 per cent of the daily needs of protein, important B vitamins, and essential minerals. Served with nonfat milk, the fat content is very low.*

nutritive composition of average cereal serving

	Cereal, 1 oz. Whole Milk, 4 oz. Sugar, 1 teaspoon	Cereal** 1 oz.	Whole Milk 4 oz.	Sugar 1 teaspoon
CALORIES	203	104	83	16
PROTEIN	7.3 gm.	3.1 gm.	4.2 gm.	
FAT	5.3 gm.	0.6 gm.	4.7 gm.*	
CARBOHYDRATE	32.2 gm.	22 gm.	6.0 gm.	4.2 gm.
CALCIUM	0.169 gm.	0.025 gm.	0.144 gm.	
IRON	1.5 mg.	1.4 mg.	0.1 mg.	
VITAMIN A	195 I. U.	—	195 I. U.	
THIAMINE	0.16 mg.	0.12 mg.	0.04 mg.	
RIBOFLAVIN	0.25 mg.	0.04 mg.	0.21 mg.	
NIACIN	1.4 mg.	1.3 mg.	0.1 mg.	
ASCORBIC ACID	1.5 mg.	—	1.5 mg.	
CHOLESTEROL	16.4 mg.	0	16.4 mg.*	

*Nonfat (skim) milk, 4 oz., reduces the Fat value to 0.1 gm. and the Cholesterol value to 0.35 mg.
**Based on composite average of breakfast cereals on dry weight basis.

Bowes, A. deP., and Church, C.F.: Food Values of Portions Commonly Used. 8th ed. Philadelphia: A. deP. Bowes, 1956.
Cereal Institute, Inc.: The Nutritional Contribution of Breakfast Cereals. Chicago: Cereal Institute, Inc., 1956.
Hayes, O. B., and Rose, G. K.: Supplementary Food Composition Table. J. Am. Dietet. A. 33:26, 1957.

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without using any type of outline or help. (10) Allow adequate time, at set and separate intervals, for reading, discussing, recalling, and fixing in mind the content of the textbook that is related to the ideas and purposes of the course.

NUTRITION ABSTRACTS AND REVIEWS

Vol. 28, April, 1958

*The riboflavin requirement of animals and man and associated metabolic relations. II. Relation of requirement to the metabolism of protein and energy. F. Bro-Rasmussen.—p. 369.

Riboflavin Requirement. This is the second of a two-part review on the requirement of riboflavin. It has been shown that the metabolism of riboflavin depends on the interdependence of utilization of riboflavin and protein which arises from the fact that the flavoproteins in general are the most labile proteins in the body. Yet riboflavin requirement is determined by the oxygen consumption of the the body, and hence by energy turnover. The conclusions that must be drawn on this basis regarding the riboflavin requirement of animals and man are briefly summarized in a figure. This figure is a diagram of the variation with age of optimal and minimal requirements of riboflavin and the critical point of excretion of riboflavin in man. Optimal requirement estimated with tissue saturation as criterion is the same for different species and does not change with age if it is expressed relative to energy expenditure.

NUTRITION REVIEWS

Vol. 16, May, 1958

*Coronary heart disease in Australia. E. H. Hipsley.—p. 129.

Vol. 16, June, 1958

*Pyridoxine and cerebral activity. D. B. Tower.—p. 161.

Coronary Heart Disease. In Australia the incidence of arteriosclerotic heart disease (including coronary occlusion) has increased since 1939. This increase has not been accompanied by any trends in the quantity or type of fat eaten. The present trends in the incidence of coronary occlusion appear to be due to causes other than diet. Marked changes in the way of life during the period studied have occurred in the physical activity associated with work and recreation. A change in the exercise pattern may be a major factor bringing about the increasing incidence of disease. Mental and emotional stresses are closely associated with relative physical inactivity. So far epidemiologic studies have been unable to assess the relative importance of exercise as compared with mental and emotional stresses as etiologic factors.

Pyridoxine and Cerebral Activity. Pyridoxine is important as a coenzyme for normal metabolism and function of the central nervous system. In specific seizure situations, pyridoxine nutrition is the critical factor. And for seizure mechanisms in general, pyridoxine function in neural tissues has focused attention on metabolic areas which may be significantly involved in such mechanisms. The evidence in regard to the glutamic gamma aminobutyric acid system appears to be highly suggestive, but it is not sufficient to permit a complete outline of a potential mechanism which would account for the initiation of cerebral seizures. Pyridoxine is also concerned with other aspects of nervous system function in addition to the area of cerebral activity. Much more detailed investigation is needed in both these areas.

PUBLIC HEALTH REPORTS

Vol. 73, May, 1958

*Federal and state poultry programs. J. W. Atkinson.—p. 449.

*Poverty, pica, and poisoning. J. E. Bradley and S. P. Bessman.—p. 467.

Federal and State Poultry Programs. Poultry hygiene programs should include antemortem and postmortem inspection of poultry for wholesomeness and supervision of sanitation in the processing and distribution of poultry and poultry products. The federal government can provide substantial assistance to the states in poultry hygiene. The Public Health Service, the Food and Drug Administration, and the Department of Agriculture all have a part in this work. But in the final analysis, state and local governments are confronted with a large part of the responsibility for establishing and maintaining effective, uniform poultry hygiene programs.

Poverty, Pica, and Poisoning. A study of 333 children living in an old, congested, low-income area of Baltimore showed that 44.4 per cent of these children had abnormal blood lead values. Since the history of pica (eating of nonfood material) was found in 69.6 per cent of the children, the source of lead apparently was paint. The increased incidence of abnormal blood lead values beginning at ten months of age continued through the third year of life and then declined. Contributing factors to this high incidence of lead intoxication seem to be related directly to environment. First, these children live in houses where lead-containing paint, used many years ago, is now flaking and peeling from the surface. Second, there seems to be widespread ignorance or disregard of the hazards from ingesting these particles. Many parents continue to accept pica as a harmless manifestation of normal infantile development. Third, crowded conditions within the home and often absence of supervision by adults allow the child to eat toxic material without restraint. The main hazard of lead poisoning in a child is lead encephalopathy which, despite recent advances in treatment, continues to result in neurologic sequels, mental retardation, or death. Since the disease is essentially environmental, preventive measures are possible.

SCIENCE

Vol. 127, May 16, 1958

*An undescribed trypsin inhibitor in egg white. K. Matsushima.—p. 1178.

Central synaptic effects of ω-guanidino acids and amino acid derivatives. D. P. Purpura.—p. 1179.

Vol. 127, May 30, 1958

*Serum lipids in adult twins. R. H. Osborne and D. Adlersberg.—p. 1294.

An Undescribed Trypsin Inhibitor. It has been known that fresh egg white inhibits trypsin and that the active component of egg white shows the properties and composition of an ovomucoid. This author has reached the conclusion that egg white contains an undescribed trypsin inhibitor which is more effective than ovomucoid. This finding was derived from the observation that native egg white inhibits the fungal proteinase but purified ovomucoid does not. The new inhibitor, which would be called "ovoinhibitor," in contrast to ovomucoid, inhibited trypsin stoichiometrically and was more effective than ovomucoid. It resembles ovomucoid in that it is quite stable in acid solution and also in that it is readily digested by pepsin but not by papain. Unlike ovomucoid, it acted on proteinase of fungal and bacterial origin.

Serum Lipids in Twins. The influence of heredity on variations in lipid levels in serum was investigated in adult twins, since genetic differences are a known factor in twins. The diagnosis of twin zygosity was established by serologic and morphologic comparisons. Each pair was classified according to whether the two members had been living together or living apart prior to and at the time of study. Statistical comparisons were based on mean variances. This analysis demonstrates that variation of lipid levels in serum results from both genetic and environmental influences. It further indicates the relative magnitude of these influences necessary to produce statistically measurable variations in lipid levels in serum of an adult population in essentially good health. Significant effects were obtained when the genetic and environmental differences of people who are unrelated were contrasted with genetically identical people with environmental differences limited by a common family background and with people of the first degree of relationship sharing a common home environment. It may be assumed that genetic factors will not be equally important in all environments and that the environmental tolerances of one population will not equal those of another.

COLLEGE AND UNIVERSITY BUSINESS

Vol. 24, May, 1958

*How remodeling stepped up our food service efficiency. S. M. Wells, Jr.—p. 50.

Remodeling for Efficiency. Increased patronage in the cafeteria dining room at the University of Michigan Student Union last year was directly due to a remodeling program which involved the building of a 70,000-sq. ft. addi-

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tion. In planning the new facilities, flexibility was considered most important. The layout of the cafeteria serving lines permits the use of one or two units as traffic dictates; one, two, or three dining rooms may be put into use according to need; and, production facilities provide for the use of an auxiliary kitchen adjacent to the main dining room should the need arise. The master kitchen, designed for the full production capacity of 6000 meals per day, services four separate units: the cafeteria, snack bar, faculty dining room, and banquet rooms. The layout of facilities aids the product flow from receiving to storage, to preparation, to final serving to the customer. Pass-through refrigerators and warmers are used for convenience and efficiency in servicing production lines; work centers are located to contribute to efficient work flow. Remodeling has solved the problem of handling soiled dishes efficiently. Now, washing and sanitization are centralized in a basement dishroom. Dishes are carried to this area by a conveyor system, and all self-bussing of dishes is eliminated. Since remodeling, patronage has increased beyond expectation.

DINER DRIVE-IN

Vol. 17, May, 1958

*How to bake a pie. D. E. Lundberg.—p. 28.
*How microwaves speed service.—p. 31.

Baking Pies. Rules for baking good pie pastry are given. Set the oven to preheat at 450°F. Begin to sift flour, using pastry flour only. Weigh after sifting. For each pound of flour, use ½ to ¾ lb. hydrogenated shortening. Shortening should be firm but plastic for blending. Use ice water in this ratio: ⅓ lb. water for each pound flour. Mix salt with water before adding to dough. Begin to mix; place all flour and fat in mixing bowl, and mix until dough resembles coarse corn meal with lumps of fat the size of peas. Mix until no flour spots are visible, but don't overmix. Add water gradually, distributing evenly and continue to mix lightly. Use just enough water to make the fat-flour dough stick together. Next, shape dough into two pieces about 3 in. in diameter and weigh them. The bottom crust dough should weigh 8½ oz.; top crust dough, 7 oz. Dust the bottom crust dough with pastry flour and roll out on board with a floured rolling pin into a circular shape ⅛ in. thick and 2 in. larger than pie pan. Fold the rolled dough in half and place in pie pan. Don't stretch. Fit carefully so that no air spaces occur. Place 1 qt. or approximately 2 lb. prepared fruits into each crust. Just before topping the pie, brush lower rim with water to help seal top and bottom crusts together. Then, roll out top crust in the same way as you rolled out the bottom crust and fold it in half. Place it on the pie and make perforations for the escape of steam. Squeeze off excess dough with the heel of the hand and flute edges with finger or fork. Bake for 10 min. at 450°F., continue to bake for total of 45 min. at 425°F. The pie is done when juice boils over.

Microwaves Speed Service. An unexpected high volume of rush orders may throw the average food operation into a tizzy and turmoil, even where quick service is a normal operation. But, with the help of the microwave oven, such emergencies are met easily. The oven almost instantly defrosts frozen stored foods so they can be used immediately. It will heat fully baked and browned rolls or baking powder biscuits in 8 seconds, heat soup instantly from the frozen or refrigerated state, produce hot pies with cheese in 7 to 10 seconds. The oven is also handy in case cheese or bread has dried a bit, as it will leave food soft and fresh in seconds. Beef, chicken, ham, and turkey in 2-oz. portions for sandwiches can be heated to serving temperatures in 5 seconds. Barbecue sauce may also be heated for pouring in small portions. This way the operator can refrigerate the sauce which is normally stored on the stove in a large quantity. Sauces handled this way are much fresher. The oven is specially good with specialties. One restaurant uses baked beans in a pot and these are kept in the refrigerator until ordered. They reach the customer in 30 seconds via the microwave oven.

FOOD ENGINEERING

Vol. 30, May, 1958

*Pushbutton foods: fad or trend? T. C. Taylor.—p. 64.

Aerosol Pack Foods. The first nonfoamy foods—barbecue sauce and chocolate sirup—joined dessert toppings in pressure packages late last year. There is every indication that more and more products will come to the market in these better, easy-to-use containers. Cheese spreads, flavored toppings, salad dressing, meat tenderizer, liquid coffee concentrate, Worcestershire sauce, edible oils, fruit sirups, pancake batter, honey, fruit toppings, condiments, decorative cake toppings, beverage-base sirups of fruit or cola type, and even jams and jellies, are being developed or considered for this type of packaging. The future outlook seems best for products that are infrequently used, since packaging costs are high and more readily accepted by the consumer on less used, specialty types of food.

HOSPITAL ADMINISTRATION

Vol. 3, Winter, 1958

*The administrator and management development. P. B. Ransohoff.—p. 21.

Management Development in Hospitals. Management development programs are as essential to hospitals as they are to industry. The starting point for any management development program in the hospital is an analysis of the administration. What are the institutional goals and what is the philosophy of the administrator? Next comes the question: Who is to be developed? A program must be an integral part of long-range planning if it is to be meaningful. Although there is no packaged program or blueprint for a program that would be adaptable to all hospitals, any program that is attempted should be based soundly on the principles of administration already established. Training responsibility, although first and entirely in the hands of the administrator, can go as far down the line organization as the administrator feels is necessary. The further it goes, the more critical becomes the need for sound two-way lines of communication, both vertically and horizontally. Programs can be formal or informal. Formal training involves outside course work, in-service training on hospital time, study of courses such as principles of administration, supervisory training, human relations, conference leadership, and other types of adult education. Informal training basically takes place on the job in an actual work situation and is given by the immediate supervisor. Committee work, counseling, the provision of educational facilities are informal training methods. It is strongly suggested that the administrator consult educational specialists prior to undertaking any management training program.

HOSPITAL MANAGEMENT

Vol. 85, June, 1958

*A dietary baedeker. Through the kitchen with gun and camera. L. Dardarian.—p. 94.

Critical Survey of Dietary Department. Although it is claimed by dietitians that special attention is given to patients' likes and dislikes, only the most obvious preferences are known and inquired about in advance. This author claims that the hardness of his eggs, the degree of doneness of his meat—in short, all the qualities which will cause the patient to be satisfied or dissatisfied with his meal are ignored until it is too late, and the dietitian can only receive a complaint. So-called "special" diets also add to the patient's dissatisfaction. For example, a bland or other therapeutic diet might be made far more palatable, were it not for the fact that the diet is originally set up and prescribed for patients with the most severe disorders. As far as selective menus go, the author feels their virtues usually exist in imagination only. This is because they often only offer the modified therapeutic diet as an alternative, or an unequal selection between items like prime ribs of beef and baked macaroni. Some selective menus offer no choice because no one can tell what the items are. Listings like baked fish, cake, chicken sauté, pork with gravy, and so on, do not convey anything and preclude choice. It is noted also that patients almost invariably get too much to eat at noon and not enough at night. Is this because key kitchen help like to leave early to get home for their own dinners? When, in response to complaints, the hospital serves two dinners daily, at noon and at night, costs run high

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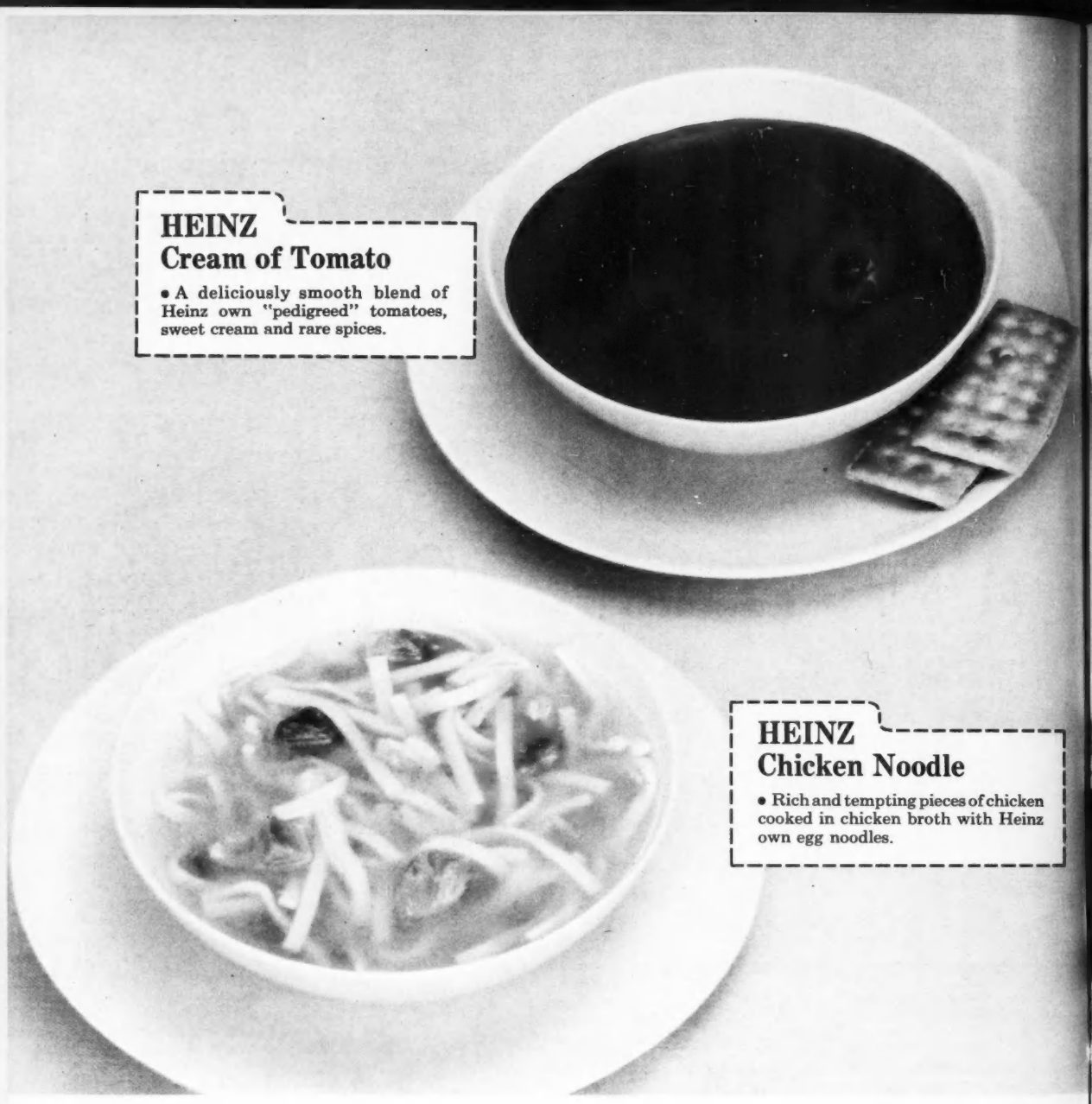

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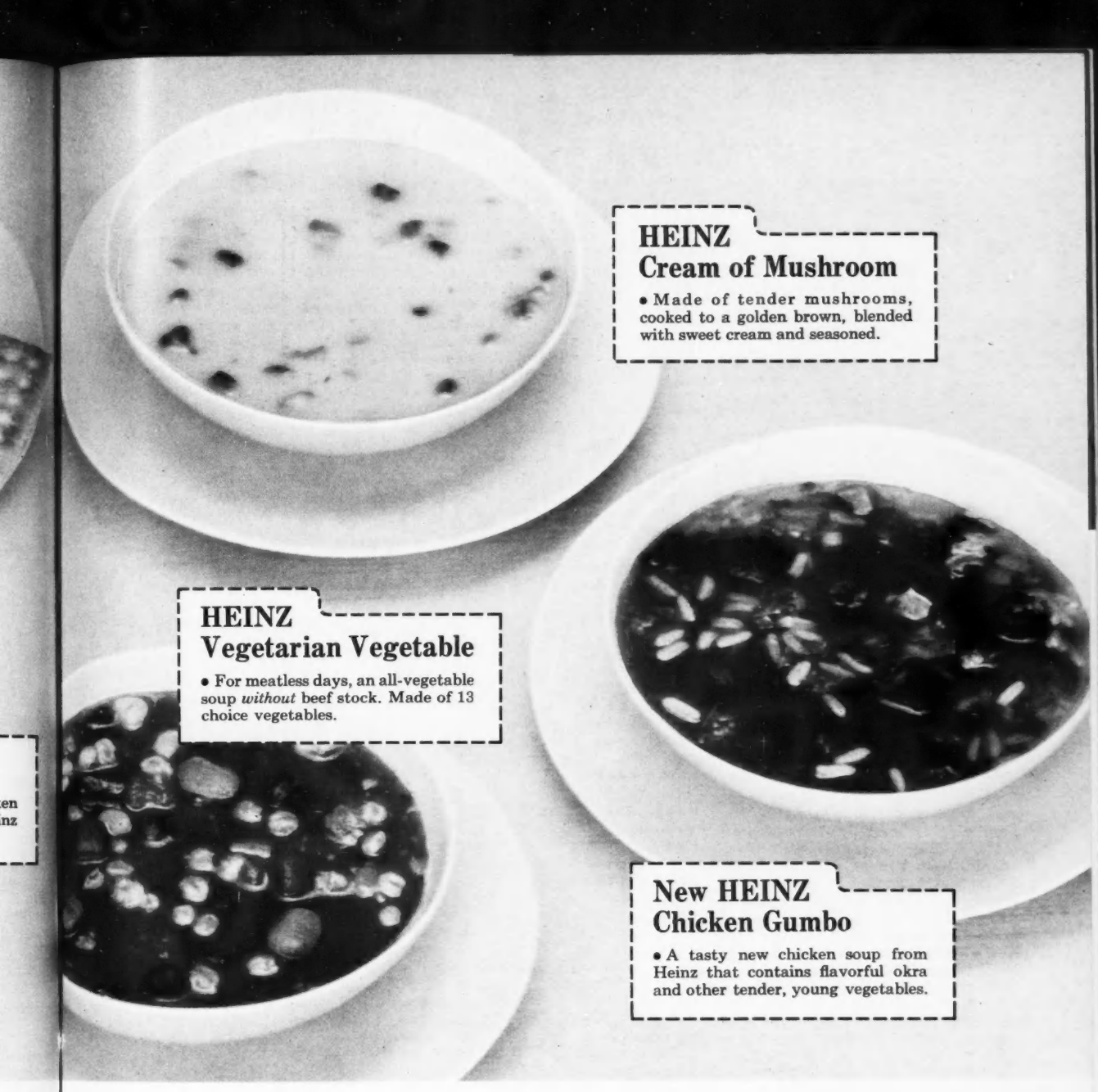

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since patients usually select the most expensive items. The solution is to have two low cost items offered at lunch where they belong, and two high cost items with dinner.

HOSPITAL PROGRESS

Vol. 39, June, 1958

*New food service trends in hospitals. R. Willett.—p. 101.

New Hospital Food Trends. Trends in food service reflected in a recent survey of chief dietitians in hospitals revealed a tendency to increasing centralization of food service operations. A rapid increase in hospitality shops combining snack service with gift and book stocks was noted. Also, the beginings of what may later be a larger trend to employment of catering services for meals to patients, as well as for the hospitals' staff and the hospitality shop, were noted. Finally, an increasing reliance on use of paper service was described. The survey was made by the Field Research Division of the Paper Cup and Container Institute.

HOSPITAL TOPICS

Vol. 36, May, 1958

*Airline food service offers mobility, efficiency, economy. J. T. Greco.—p. 35.

Airline Food Service. Barnes Hospital in St. Louis has adapted airline food service techniques and equipment with great success. As described, the hospital uses specially designed food carts, which will accommodate electrically heated ovens and containers, to transport patient meals from a completely centralized kitchen to small galleys on the floors. The production of food in the kitchen is organized on a straight-line assembly basis which breaks down into three parts: production assembly or pre-assembly; hot and cold food assembly; and final tray assembly. The first two operations take place in the kitchen; final assembly is made in the galley. A team of food service workers serves and collects trays from the galley and they are transported back to the kitchen. There dishes are sorted by kind on mobile landing tables, and all silverware is dumped into a mobile sink for presoaking. The whole sanitizing operation is organized for speed and maximum efficiency. Landing tables roll up to the dishwashing machine for loading. Inventory of service is easy since all pieces are segregated before washing. Inspection and racking is also made simple by the use of mobile tables which receive the lots of finished dishes.

HOSPITALS

Vol. 32, May 16, 1958

*Purchase specifications for ready-to-cook meats. H. D. Gebert and W. Langum.—p. 77.

Vol. 32, June 1, 1958

*Training supervisors by mail. R. E. Silvester, E. A. Atkinson, and R. A. Kumpf.—p. 54.

Hospital Specifies Meats. Chicago's Passavant Memorial Hospital has developed its own set of purchase specifications for ready-to-cook meats. In drawing up the specifications, it was recognized that hospitals can neither afford nor do they need to purchase only top graded meats. The grading problem was solved in writing the specifications by offering grade choices for certain meat cuts, permitting the hospital to take advantage of market conditions. Specifications were developed for beef, veal, lamb, and fresh and smoked pork cuts. Sausage products were omitted, because of local differences and preferences. No standards were developed for frozen tenderized steaks. Each purveyor is furnished with a set of Passavant's specifications and the meat-bid sheets. The hospital receives weekly bids by mail. Actual meat supplies are checked by employees using the specifications list. A copy of the specifications for ready-to-cook meats is included with this article.

Training Food Supervisors by Mail. Pennsylvania State University has developed a course for qualified hospital dietary employees which, through study and on-the-job training, supervised by a qualified dietitian, develops competent food service supervisors. Dietary employees who are high school graduates, who have supervisory ability, who are endorsed by the dietitian and hospital administrator in charge, and who can fulfill the health requirements, may register at any time for the course. Registration fee covers costs of books and uniform as well as endorsement fee. The course must be completed in twelve months. Trainees study their correspondence material and work under the supervision of the dietitian in various capacities throughout the dietary department. The dietitian acts as intermediary between the student and the University, monitoring tests, and relaying them and assignments to the University instructor. Approximately 2 hr. of each work day are spent in practical learning supervised by the dietitian.

INPLANT FOOD MANAGEMENT

Vol. 4, April, 1958

*Operating the inplant cafeteria.—p. 23.

Vol. 5, May, 1958

*Operating the inplant cafeteria. C. J. Zihlman.—p. 59.

Sanitation—Operating in the Inplant Cafeteria. The author here considers sanitation in a broad sense which includes esthetic and psychologic stimuli. Odor control, lighting, decoration of the walls and ceilings, and floor treatment as well as temperature control, ventilation, noise control, and anything else that affects the appeal of food to the worker is assumed to be connected with sanitation. Sanitation specifically concerned with food handling activities is also discussed. Recommendations concerning receiving and storage are given. Receive and store particular types of foods separately; create separate areas for pre-preparation; set up continuous cleaning schedules for these receiving, storing, and preparation areas. Kitchen cleaning programs should provide for the complete removal of wastes created in preparation, and should insure the complete cleanliness of dishes and utensils. The author emphasizes that clean utensils and dishes are responsible for the worker's acceptance of the food. To be sure that the food service is clean, see that dishes are correctly preflushed and racked and that the person in charge of dishwashing understands the elimination of bacteria, stain control, and the proper use of equipment. The complete sanitation program should provide a system of checks to insure that even the most menial job is done correctly.

Operating Rules for Glassware and China. The cost of the use of table glassware can be easily and definitely controlled. By using specially strengthened or heat-treated glassware, thin-blown, and properly designed, savings can be made. Proper handling of individual pieces, education of employees in techniques of cost control, and maintenance of proper handling equipment can further cut costs. The avoidance of china breakage is a matter of simple common sense. (a) Do not strike two pieces of ware together. (b) Don't stack too high. (c) Avoid nesting cups. (d) Don't slide one plate across another under pressure. (e) Inspect the dishwashing area during peak periods of operation. (f) Train employees in correct handling.

INSTITUTIONS MAGAZINE

Vol. 42, June, 1958

*Communications: the art of giving "the word." J. A. Ritchey.—p. 6.

*How to choose flooring for a kitchen. F. T. Hiliker.—p. 20.

*Guide to soft-served ice cream. P. H. Tracy.—p. 25.

*Pilferage problem can be solved. J. D. Fellers.—p. 46.

*How to prepare veal and variety meats. A. Macfarlane.—p. 93.

*Veal cookery.—p. 95.

*How to use variety meat in entrées.—p. 100.

*Improve pot, pan washing. D. F. Williamson.—p. 117.

*Control hard water deposits. W. J. Flynn.—p. 125.

Communications. This first article in a series conveys some fundamental ideas concerning the general problem of communications. Communications in organizations can be classified as three types: downward communication or the transferring of orders or information from management to employees; upward communications or the transfer of work data and information, attitudes, complaints, and so on, from employees to supervisors and management; and, horizontal communications or the exchange of information and cooperation between employees and separate departments on the same level. There are several guiding principles which are effective in bringing about good communications. Be sure that messages reach

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Super-Mealcart. (Design Pat. Pending) (S-3010-MR Illustrated 20 Trays with Beverage Bar S-3010)

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ONLY SHAMPAINE ELECTRIC SUPER-MEALCART HAS . . .

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- all stainless steel, double-walled, fully-insulated construction throughout. 2½″ insulation between hot and cold compartment.
- compact heated drawers accommodating three 9″ dinner plates, *plus* three 5½″ plates, *plus* three coffee or tea cups
- an oven compartment with internal, waterproof installed, stainless steel, sheathed sealed heaters. Accessible *without* dismantling or turning cart upside down. Provides uniform temperatures (185° F.) throughout compartment.
- fully-insulated, recessed and double-walled doors of oven compartment close tightly against recessed frame. Full-length *stainless steel* piano hinges on doors.
- rugged, compact tray slides that can be removed in easy to clean *sections*, providing clearance between tray slides of 3¾″ for ½ pint "carton-type" milk container.
- models in 20, 24 and *30-meal size, for both *mechanical* and *eutectic* refrigeration (Dole cartridge), and with or without beverage dispensers.

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the person intended. See that messages are clearly stated and are consistent with previous orders or communications. Be sure, too, that messages are adequate containing sufficient information but not too much detail. Time communications properly to be sure that they are effective; see that the recipient is receptive. Any consideration of communications in organizations as a whole should not overlook the informal communications pattern built up on social channels. This pattern is often even more important than the formal pattern.

Kitchen Flooring. Kitchen and service area floors require careful design in regard to levels, abutment to floor finishes in other areas, and adaptation at doorways and stairs. Floor finishes must be chosen carefully. Often the type of finish can be varied from one department to another to allow for a high grade finish generally, but a less costly type of finish in areas subject to heavy traffic. Kinds of floors are many, with ceramic or quarry tile making a high quality floor in the heavy duty kitchen, and vinyl the best for the rather small and lightly used kitchen. A magnesite-finished floor is hard to surpass if all the hazards of application can be avoided. Terrazzo flooring should not be used in kitchen areas since it cannot withstand grease and it is hard underfoot. Cement is unsuitable in the kitchen, but it can be used in receiving areas and on storeroom floors. Rubber flooring is no longer used since it can become very slippery. It is best in considering a finish to find out where there is a good applicator to do the job.

Soft-Serve Ice Cream. Soft-serve ice cream centers should be equipped with topping cabinets and must have facilities for storing mix. Types of storage available for mixes are the walk-in mix cooler; the cabinet cooler; the bulk tank mix cooler. Temperatures in storage should be 40° to 32°F. at all times. Combination carton and cone racks will also be needed to insure quick service. Topping and coating warmers are needed. Every operator should also provide himself with an accurate overrun scale and a low temperature thermometer.

Solving Pilferage Problems. Clothing is frequently used as a tool in pilfering. Thus, beware of employees who wear coats or carry them to and from work in warm seasons. Kleptomania, the habitual stealing by an employee who may be in every other way commendable, must also be watched for. Systematic robbing of the till has often been perpetrated by an undiscovered kleptomaniac. The loss of food and other items to outsiders is usually easy to control if the security of the food service organization is good and good accounting and inventory procedures are in effect. The inside man and the inside job must be watched for more carefully, however. Thus, receiving clerks, in collusion with truck-drivers or purveyors, can cause large losses. The employee who steals large quantities of commodities right under the nose of management is often very clever and difficult to catch. Thus, in one organization an employee faked the contents of cases for years, removing real goods. His system worked out so cleverly that the losses never came to light through normal use or check methods. An observant executive uncovered the plot. Vendor contrivances must be guarded against also. Vendors have attempted to bribe purchasing agents and may on occasion try to work through a key member of the organization.

Veal. In high-quality veal, the fat is clear, firm, and white. The lean is light pink with no marbling, as veal contains little fat. The texture of the lean is fine, fairly firm, and velvety in appearance. Bones are soft, porous with a reddish tinge, and ends of some are still in the cartilage stage. Cuts resemble beef cuts although they are from one-third to one-half the size. Seasonal maximums and minimums of weight should be established for veal since weights vary at different times. Grades of veal are: prime, choice, and good; packer's brands closely parallel government grades. Prime or top choice are recommended grades for quantity food operators. Purchasing amounts of veal is simplified by consulting the article. "Food Yields in Institutional Food Service," which appeared in the April 1958 issue of the JOURNAL OF THE AMERICAN DIETETIC ASSOCIATION. Leg cuts of veal purchased with bone yield an average of 42 to 51 per cent cooked meat. Boneless veal gives an average of 76 per cent cooked meat. Shoulder cuts with bone yield 54 per cent cooked; without bone, 83 per cent. Similar to other types of meat, veal, regardless of the style of purchase, should be bought by specification, stating cut, grade, size or weight, trim, fresh or frozen, and so on.

Veal Cookery. Since veal is lacking in fat and contains a considerable amount of connective tissue, it requires long, slow cooking. Best methods of cooking are roasting, braising, frying, and stewing. Chops and steaks are best braised. Only high-grade loin or rib chops from more mature, fatter animals should ever be broiled. Cutlets are deep-fat fried. Always cook to the well-done stage regardless of cut. Individual frozen cuts may be cooked without prethawing. For braising, fresh or frozen chops are dipped in flour and browned in hot fat. When browned on both sides, add liquid. Liquids may be sweet or sour cream; tomato juice or canned tomatoes; dilute concentrated canned chicken, tomato, celery, or mushroom soup; canned purple plum sirup and whole plums; broth; or water combined with sliced onions, diced green peppers, and sliced carrots. Cover and cook slowly at 350°F. in the oven or on top of the range until fork-tender. Add necessary liquid from time to time. Popular braised entrées are veal birds, veal steak paprika, and French veal balls. Frozen veal cutlets are improved by coating and deep-fat frying at 375°F. until golden brown—then baking at 350°F. for 15 min.

Variety Meats in Entrées. Variety meats include liver, kidneys, heart, tongue, sweetbreads, tripe, brains, and other meats. All contain high amounts of essential nutrients—amino acids, vitamins, and minerals. In addition, they lend themselves to a variety of appetizing and popular dishes. Basic rules for preparing each of these variety meats is given, and a section on sausages is presented. Selected recipes accompanying this article include those for: wieners in barbecue sauce, O'Brien's famous country sausage, luncheon meat loaf with marmalade, baked liver, sweetbreads Chasseur, escalloped sweet potatoes and apples with sausage links, beef kidney stew, sweetbreads Chantilly with wild rice, pepper pot soup, green peppers with sausage chunks, veal sweetbreads with creamed mushrooms à la royal, braised liver with onions, and liver dumplings.

Improve Scullery Work. Inadequate compartments in the pot and pan sink, compartments too small in size, undersized drainboards or none at all, and old, worn out brushes all account for poor pot-and-pan washing. Inadequate lighting and ventilation, bad hot water supply, poor detergents, and improper use of cleaners also contribute to a bad job. These conditions can be corrected by a careful survey and action. The "what to do and how to do it chart" of pot washing, given with this article, will be helpful in correcting any poor pot-and-pan procedures.

Controlling Hard-Water Deposits. There are several ways to remove build-up of mineral deposits and control them. You may use an abrasive or scraping tool, or you can use inorganic or mineral acids. These methods often damage the metals being cleaned. The modern way to control deposits is by applying organic acid detergents. These offer no particular problems from the standpoint of safety or corrosion and are not harmful to the skin as diluted for use, yet are excellent lime solvents. A routine program can be set up using organic acids which will not only remove lime film, but more important, do a good job of keeping it off. The unique characteristics of organic acid detergents also offer countless opportunities to cut cleaning costs in the routine care of practically all types of bright metal food service equipment.

RESTAURANT MANAGEMENT

Vol. 82, May, 1958

*Automation: what it can do for you. A. C. Avery.—p. 50.

*Chicken: 15 menu suggestions. A. Easton.—p. 74.

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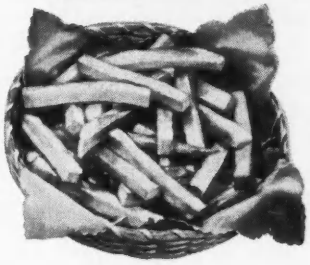

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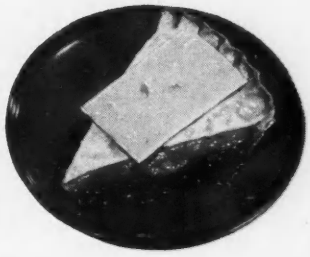

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Coffee	**Lime**
Strawberry	**Almond**
Orange	**Caramel**
Lemon	**Peppermint**

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*What's your liability for slippery floors? A. W. Gray.—p. 81.

Automation. The author surveys the needs of every department and gives practical automative solutions. These include, in receiving: use of belt conveyors, raised carts, and wheeled hand trucks; in the storerooms: use of shelves on wheels, broad-based cans on wheels; and dial or fan-type scales placed at eye-heights; in the vegetable preparation room: use of shelf-high carts for unloading supplies, chutes to automatically feed vegetables to peelers, and converted washing machines with whirl dry baskets to clean greens; in the cooking area: use of a scraper-mixer in the steam-jacketed kettle, thermostat controls to keep temperatures level; automatic water meters for loading kettles, and the addition of a cooling coil or piped running water to cool large steam-jacketed kettles quickly and cheaply. It is also recommended that deep-fat fryers be well insulated and that they be used as vegetable cookers; that fryers have automatic controls which would lower weighted loads into the fat for a controlled time, automatically. Ovens should be equipped with automatic oven meat thermometers with external temperature dial and alarm box. Griddles may be improved with a mechanical timer, and wall mount to give griddle temperature. At food service stations, continuous belts are recommended as devices to help speed and automate service. Almost every tool used in the dish-washing process should be automatic.

Chicken Menus. Here are fifteen delicious suggestions for chicken entrées including: barbecued chicken with rice, green beans, whole kernel corn; chicken soufflé with mushroom sauce, asparagus, baked small tomato; chicken divan or sliced chicken and broccoli with Mornay sauce, grilled; chicken roll made like a chicken loaf with layer of rich biscuit crust around loaf, baked and served with mushroom sauce; chicken curry on rice; fried chicken, Mexican corn, a spiced peach; and corn pancakes with creamed chicken, crisp celery hearts, stuffed olives. Other suggestions include: baked chicken-noodle square with gravy, green peas with diced celery, jellied cranberry sauce; chicken livers *en brochette* with yellow rice; gourmet chicken or chicken, waterchestnut, mushrooms, sherry, and sliced almonds; luncheon combinations such as chicken salad sandwiches and dessert or chicken salad served in half an avocado; chicken pie; Chinese chicken dishes; chicken pizza; and chicken Newbury on toast. Recipes for several of these specialities are given.

Liability on Floors. The proprietor is no insurer of the safety of his customers, but he must observe care to see that the premises are reasonably safe for those who come into or on them. This seems to be the extent of the duty enjoined upon him. To impose liability for injury to an invitee by reason of the dangerous condition of the premises, the condition must have been known to the owner or occupant or have existed for such time that it was the duty of the owner or occupant to know it. In several suits brought against owners which involved falls by patrons due to some small foreign matter on the floors, rulings were against the plaintiffs and the owners were not held responsible.

WHAT'S NEW IN HOME ECONOMICS

Vol. 22, June, 1958

*Cereals taste good and are good for you. F. L. Bienert.—p. 24.

*Modern ways with alimentary pastes. Macaroni, spaghetti, noodles.—p. 34.

Cereals. More than two dozen varieties and kinds of cereals are available to lend interest to breakfasts. Cereals are still best liked when served plain with sugar and milk or cream. However, for added zest, they may be mixed and matched in numberless combinations. Crisp cereal can be sprinkled on cooked cereal; ready-to-eat cereals can be combined into a mixed, tossed bowl: or a preference tray can provide each member of the family with his own favorite. Sugars can be granulated, powdered, light brown, dark brown, or in liquid form such as maple or corn sirup or molasses. Milk and sugar can be combined for a pour-topping. Milk, too, can be varied: chocolate, butterscotch, maple sirup, molasses, or crushed fruit blended with the milk make cereals more tempting. Plain fresh-frozen or dried fruits enhance flavors of cereals when they are used as uncombined toppings. Fresh whole fruits are good when layered throughout a bowl of crisp flakes. Cereals in their modern forms contain liberal amounts of niacin, iron, thiamine, carbohydrate and phosphorus, good amounts of protein and fair amounts of riboflavin and calcium.

Pasta. There are today over two hundred varieties of macaroni products, although not all are well known. Pasta blends tastefully and attractively with many types of foods in many kinds of dishes, including hot casseroles and salads. Modern ways of cooking pasta dictate that they never be overcooked. If the casserole or dish is to be further cooked by baking, it is best to shorten boiling time a few minutes. One of the newest ways of cooking pasta is to combine fat, water, and vegetable ingredients for sauce, and uncooked macaroni, spaghetti or noodles in a covered skillet or Dutch oven and cook together until the pasta is tender and the sauce combined. As a base for casserole dishes, the pastas may be combined with beef, lamb, pork, veal, poultry, sea food, fish, cheese, or vegetables. For a chafing-dish specialty, they may be blended with Italian-type sauces, such as tomato, mushroom and tomato, meat sauce, tomato and meat balls, or specialty sauces with a continental flavor.

The right cup of coffee pleases customers...means multiple profits for you

WHEN YOU SERVE Chase & Sanborn coffee, you satisfy your customers' desires for fine coffee, at economical preparation cost to you. This means profits from satisfied customers and profits from every cup of Chase & Sanborn coffee.

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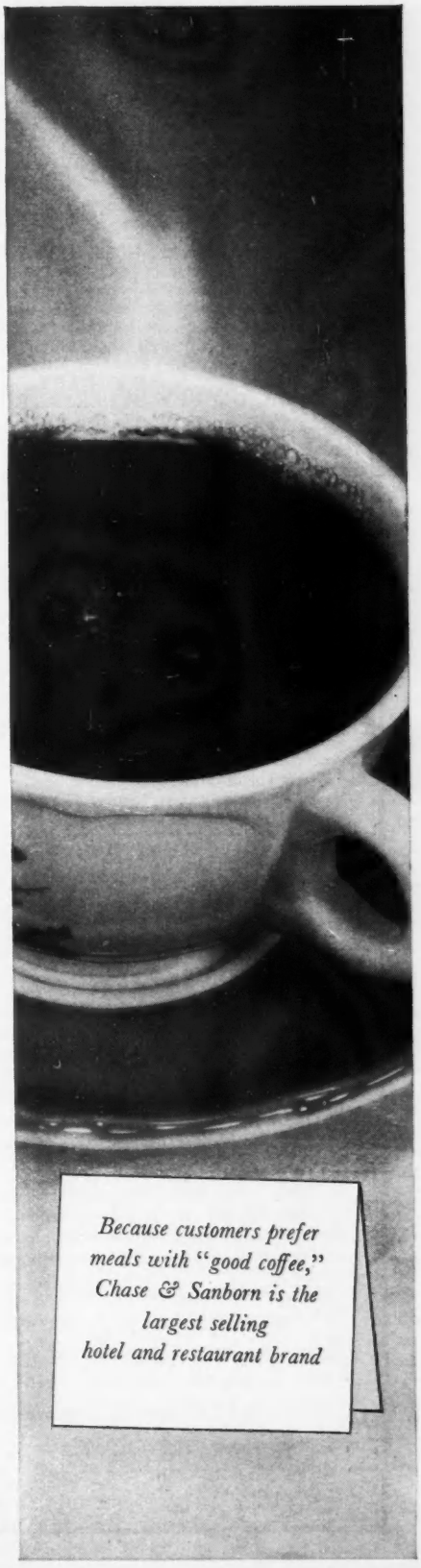

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IMPORTANT . . . MAIL YOUR APPLICATION PROMPTLY

Application for Housing Accommodations

THE AMERICAN DIETETIC ASSOCIATION

Philadelphia • October 21-24, 1958

For your convenience in making hotel reservations for the coming meeting of THE AMERICAN DIETETIC ASSOCIATION October 21-24, 1958 in Philadelphia, hotels and their rates are listed below. Use the form at the bottom of this page, indicating your first, second and third choice. Because of the limited number of single rooms available, you will stand a much better chance of securing accommodations of your choice if your request calls for rooms to be occupied by two or more persons. All reservations must be cleared through the Housing Bureau. ALL REQUESTS FOR RESERVATIONS MUST GIVE DEFINITE DATE AND HOUR OF ARRIVAL AS WELL AS DEFINITE DATE AND APPROXIMATE HOUR OF DEPARTURE, ALSO NAMES AND ADDRESSES OF ALL PERSONS WHO WILL OCCUPY RESERVATIONS REQUESTED *MUST* BE INCLUDED.

Hotel	Single	Double	Twin	Suites
ADELPHIA	$ 6.50 up	$ 9.00 up	$12.00 up	$25.00 up
BARCLAY	10.00	14.00 up		30.00 up
JOHN BARTRAM	4.50 up	7.50 up	9.00 up	25.00 up
BELLEVUE-STRATFORD*	8.00 up	12.00 up	12.00 up	30.00 up
BENJAMIN-FRANKLIN*	7.00 up	10.00 up	14.00 up	30.00 up
DRAKE	7.00 up	10.00 up	13.00 up	20.00 up
ESSEX	4.50 up	7.00 up	9.00 up	22.00 up
NORMANDIE	5.00 up	7.00 up	8.00 up	18.00
PENN SHERWOOD	6.00 up	10.50 up	10.50 up	15.50 up
ROBERT MORRIS	5.00 up	8.00 up	9.00 up	
ST. JAMES	4.75 up	7.00 up	7.50 up	15.00 up
SHERATON	8.50 up	13.00 up	15.00 up	30.50 up
SYLVANIA	5.50 up	9.50 up	9.50 up	20.00 up
WARWICK	11.00 up	14.00 up	14.00 up	22.00 up

(*) Headquarters hotels

In the event that the hotel room rate structure is changed prior to the above convention these rates will be changed accordingly.

ALL RESERVATIONS MUST BE RECEIVED PRIOR TO: September 20, 1958

American Dietetic Assn. Housing Bureau
Convention & Visitors' Bureau
Penn Square Bldg., Juniper & Filbert Sts.
Philadelphia 7, Pa.

Please reserve the following accommodations for: THE AMERICAN DIETETIC ASSOCIATION Convention in Philadelphia, October 21-24, 1958.

Single Room_____ Double Bedded Room_____ Twin Bedded Room_____

Other Type of Room_____

Rate: From $_____ to $_____

First Choice Hotel _____

Second Choice Hotel _____

Third Choice Hotel _____

Arriving at Hotel (date) _____ hour _____ A. M. _____ P. M. Leaving (date) _____ hour _____ A.M. _____ P.M.

THE NAME OF EACH HOTEL GUEST MUST BE LISTED. Therefore, please include the names of *both* persons for *each* double room or twin bedded room requested. Names and addresses of all persons for whom you are requesting reservations and who will occupy the rooms asked for:

_____

_____

_____

_____

(Individual Requesting Reservations)

Name _____

Address _____

City and State _____

If the hotels of your choice are unable to accept your reservation the Housing Bureau will make as good a reservation as possible elsewhere provided all hotel rooms available have not already been assigned.

About Your Annual Meeting—October 21-24

Philadelphia—Twixt the Schuylkill and the Delaware

SPEAKERS' NOTES

A fine harvest of stimulating information—the latest findings in research, the conclusions of authorities on topics of current interest—will be yours when you attend the sessions in Philadelphia.

The names of a number of speakers who will appear in the program were given to you in the July issue of the JOURNAL. Arrangements are in process for many other distinguished leaders in their respective fields.

The following persons have accepted invitations to appear on our platforms:

James B. Wyngaarden, M.D., School of Medicine, Duke University, will give his views on an aspect of purine metabolism.

W. A. Krehl, M.D., Ph.D., Nutrition Laboratory, Department of Biochemistry, Yale University, will show the relationship between nutrition and skin disease.

Adelia Beeuwkes, School of Public Health, University of Michigan, will discuss teaching today's college students.

Mark A. Hayes, M.D., Department of Surgery, Yale University School of Medicine, has agreed to speak on the proposed rational approach to postoperative feeding.

This year a skeleton program will be published in the September issue of the JOURNAL and the complete program in October.

ALUMNAE MEALS

Convenience, time-saving, and palatable food have been given consideration in developing plans for alumnae meals. At this early date, it is relatively safe to say that these meal functions will be held at Gimble's Department Store, the Benjamin Franklin and Bellevue-Stratford hotels.

If you have not notified the alumnae meals chairman of your internship or college or university that you wish to attend one of these reunions, you are urged to do so without delay.

SIGHTS ARE "INSIGHT" TO PHILADELPHIA STORY

Tradition, the warp and woof of our common past, speaks out eloquently in Philadelphia's true story. Here, in its original luster, our history still shines in a collection of "uniquities" and "firsts" that are carefully dusted and cherished. Even in the new additions to Philadelphia's skyline, its famous firms that have flourished this side of 1900, partake of grace.

This grace, an exclusive aura of originality that first gave form to American institutions, is found expressed everywhere. In fact, the crackling atmosphere of historical battles, entrenched conservatism, busy free enterprise, and aristocratic charm is enough to make other cities of respected age feel positively "nouveau."

Pointing up history in our time are such landmarks as:

. . . *Independence Hall's* graceful tower and fine interior woodwork. Here Washington received formal command of the Continental Army, the Declaration of Independence was adopted, the Articles of Confederation ratified, and the Constitution framed.

. . . The *Liberty Bell*, near the south door on the first floor of Independence Hall. It was rung at the adoption of the Declaration of Independence in 1776. A year later, as British troops entered the city, it was hurriedly removed to Allentown and concealed in a cellar. It rang out a welcome to Lafayette in 1824 and cracked when tolling the death of Chief Justice John Marshall in 1835.

. . . The *Old Custom House*, built to house the second Bank of the U.S. The statue in front is one of Robert Morris, financier of the Revolution.

. . . *Carpenter's Hall* where the First Continental Congress assembled in 1774. Among historical exhibits here are minutes of the First Continental Congress, letters and manuscripts of the period, and one of Stuart's portraits of Washington.

. . . Across from Independence Hall, the *Curtis Publishing Company*, home of the *Saturday Evening Post*. You may wish to take a guided tour through the plant which occupies 23 acres of floor space. The building, which houses giant presses that turn out millions of magazines each month, is created in Georgian style.

. . . The *U.S. Mint*, the first mint in this country, located between 16th and 17th at Spring Garden Street. Here, from a glass enclosed gallery, you may observe the minting of U.S. coins and the coins of many foreign countries, too.

PANORAMA OF PRODUCTS

Assembled for our "Annual Meeting '58" will be an army of exhibitors displaying products both new and familiar. From every part of the U.S. they'll come with foods, equipment, information, and educational tools to turn Convention Hall's exhibit arena into a vast showroom for your browsing and approval. Indeed, they offer you a marvelous opportunity to keep up to date with the happenings in the institutional market, to meet friends and sight-see in a bustling atmosphere of color, conversation, and showmanship. So plan now to attend and meet the exhibitors who are preparing to meet you!

American Machine and Foundry Company will display AMF "Lowerator" dispensers, including the double-stack dish dispenser which is electrically heated and can be used as a stationary or mobile unit.

Metropolitan Wire Goods Corporation will show for the first time its new aluminum dolly for dishwashing machine racks. This heavy duty vehicle is equipped with plastisol corner bumpers and ball bearing wheels, and is reasonably priced.

Shampaine Company will feature the "Super Mealcart" with automatic refrigeration and exclusive step-down design. The "Super Mealcart" will be available in 20-, 24-, and 30-meal sizes with mechanical or cartridge refrigeration.

Steele-Harrison Manufacturing Company's booth will contain floor samples of its "Mercury Hospital Tray Carts" which feature full-length, radiant-heated, hot food compartments that keep food hot even when doors are open.

The Kent Company, Inc., promises to unveil its newest piece of equipment in the "Turbo-Vac" line—a vacuum and blower which offers a big capacity tank. The new model, "75," will handle all maintenance cleaning operations including rugs, carpets, walls, and wet and dry floors.

International Molded Plastics, Inc., announces that it will show a complete line of "Arrowhead" Melmac dinnerware and introduce several new and colorful patterns in three featured plates.

The Chicago Dietetic Supply House, Inc., will show dairy products for use in the sodium-restricted diet, in addition to "Cellu" products for use in sugar-restricted and calorie-controlled meals.

The Institutional Products Division of *General Mills, Inc.*, will feature a completely new package which incorporates menu planning ideas, baking hints, and several variations obtainable from each baking mix. A number of brand new recipes and ideas will also be introduced.

Wesson Oil and Snowdrift Sales Co. will present chiffon cakes and salad dressings for visitors' approval. Salad variations—ten tasty, distinctive dressings which can be made in a matter of seconds—will be sampled, and handy, file-sized cards giving the recipes will be distributed.

Armour and Company will provide all visitors the opportunity to find out about its service materials and about what's new in meats.

Cereal Institute, Inc., has prepared material for visitors on quick and lasting energy breakfasts. This information will be made available in leaflet form.

The American Institute of Baking plans to offer interested visitors a variety of nutrition teaching aids suitable for use with student nurses and other interested hospital personnel.

Borden Award Goes to Dr. Reynolds. May S. Reynolds, Ph.D., was named the 1958 recipient of the Borden Award at the annual Meeting of the American Home Economics on June 26 in Philadelphia. Dr. Reynolds has been engaged in research in the field of human nutrition for many years and has added significantly to the body of knowledge in this area, especially with respect to protein and amino metabolism of women. For more than a quarter of a century, Dr. Reynolds has taught nutrition to undergraduate students at the University of Wisconsin, and in recent years has directed graduate students who have received their master's and doctor's degrees. The Award, which consists of a gold medal and an honorarium of $1000, was presented by J. H. McCain of the Borden Company.

At the close of the meeting of the American Home Economics Association, the following officers were installed for the coming year: *President*, Olga P. Brucher, Dean, College of Home Economics, University of Rhode Island, Kingston; *Vice-Presidents*, Dr. Elizabeth Dyar, Dean, School of Home Economics, Colorado State University, Fort Collins; Dr. Laura W. Drummond, Professor of Home and Family Life, Teachers College, Columbia University; and Dr. Helen R. LeBaron, Dean of Home Economics, Iowa State College, Ames; *Recording Secretary*, Dr. Dorothy S. Lyle, Director of Consumer Relations, The National Institute of Drycleaning, Silver Spring, Maryland; and *Treasurer*, Florence W. Low, Head, Department of Home Economics, Texas A. & M. College, College Station.

Iowa State Honors Alumni. As part of the centennial celebration of Iowa State College, a special All-Alumni Centennial Recognition Luncheon was held at Ames on June 14. Several prominent A.D.A. members were among those to receive recognition and awards.

Two were included among the one hundred men and women, alumni, and friends to receive Centennial Citations for having "made a unique contribution to the status of Iowa State College." They are: *Fern Gleiser*, Past President of A.D.A., and Professor of Institution Economics and Management, University of Chicago; and *Charlotte M. Young*, Ph.D., Professor, Graduate School of Nutrition, Cornell University, Ithaca, New York.

An Alumni Merit Award "in recognition of pre-eminent service in advancing human welfare" was presented to *Miriam E. Lowenberg*, Ph.D., Head, Department of Foods and Nutrition, The Pennsylvania State University, University Park.

To *Pearl P. Swanson*, Ph.D., Professor of Nutrition, Iowa State College, went a Faculty Citation, which was "awarded for long, outstanding, and inspiring service on the College staff."

Institute on Dietary Administration. In Kansas City, Missouri, from September 8 to 12, the American Hospital Association will present an Institute in Hospital Dietary Administration in cooperation with A.D.A. This will be a refresher course, as well as a source of latest information. Speakers, informal group discussions, and member participation will serve to stimulate those in attendance. Further information and application blank may be obtained from the AHA Institute Office, 18 East Division Street, Chicago 10.

White House Conference in 1960. In May, President Dwight D. Eisenhower announced that a 1960 White House Conference on Children and Youth will be held and asked that the Department of Health, Education, and Welfare begin to make the necessary preparations. More recently, Marion B. Folsom, Secretary, has invited state governors to appoint special committees and begin preparations for a national and state-by-state stocktaking on problems of children and youth. These committees would serve as liaison groups between the state and the over-all national advisory committee to be appointed by the President.

World Health Assembly. The Eleventh World Health Assembly of the World Health Organization was convened in Minneapolis May 28 to June 13. First order of business was the election of Dr. Leroy E. Burney, U.S. Surgeon General, as President to succeed Dr. Sabin Hassan Al-Wahbi of Iraq. The assembly opened on May 28 following a special two-day session commemorating the Organization's tenth anniversary. Delegates from eighty-eight member nations attended.

Major health programs considered by the Assembly included: the malaria eradication program as it is evolving throughout the world; research; the role of WHO in health aspects of atomic energy; smallpox eradication; poliomyelitis; and sports medicine. The Assembly authorized WHO's Director General to seek funds for malaria eradication not only from governments, but all possible sources, including foundations, industry, labor organizations, institutions, and individuals. In the realm of research, the Director General was requested to "organize and arrange for a special study of the role of WHO in research, and of ways in which WHO might assist more adequately in stimulating and coordinating research and developing research personnel." For this purpose, the U.S. government is making available $300,000 to WHO to set up studies of ways and means by which research can best be promoted.

In ten years, the World Health Organization has grown from an initial membership of twenty-six countries to eighty-eight, and its budget has expanded from $5,000,000 to nearly $14,300,000, not including $6,000,000 of UN Technical Assistance funds and nearly $9,000,000 contributed so far to the special malaria eradication funds of both WHO and its regional office in the Americas, the Pan America Sanitary Bureau.

Winifred Howard Erickson attended this anniversary Assembly as A.D.A.'s representative.

Plentiful Foods

The U.S.D.A. expects the following foods to be in plentiful supply during the month of August:

Lemons, fresh and processed
Peaches
Potatoes
Vegetable fats and oils
Vegetables, summer
Watermelons

DuBois Scholarships. In the first six months of 1958, awards to seventeen state dietetic associations for scholarships to nineteen students of dietetics in American colleges and universities have been made possible by grants-in-aid by the T. V. DuBois Foundation, Cincinnati. The Foundation was organized by the late T. V. DuBois in 1951, founder of the DuBois Co., Inc. Recipients of the awards in 1958 have been:

Martha Bailey, Tuscaloosa, Alabama
Caroline Barnes, Kent, Ohio
Joyce Erickson, Wadena, Iowa
Sarah Diener, Nappanee, Indiana
Beulah Dillow, Charleston, West Virginia
Shirley Goldstein, Dorchester, Massachusetts
Jessie Hinckley, Salt Lake City
Carolyn Hopperstad, Burlington, Iowa
Mabell Lyon, Milledgeville, Georgia
Wilma Packard, Moscow, Idaho
Dorris Jean Pearson, Jefferson City, Missouri
LaDonna Sandahl, Portland, Oregon
Clarissa Seney, West Grovernordale, Connecticut
Sally Ann Seubert, Pittsburgh, Pennsylvania
Emily Stanley, Lodge, South Carolina
Caroline Watkins, Anderson, South Carolina
Lanell Wiggins, Hialeah, Florida

Fulbright Award for 1959-60. A new announcement listing Fulbright Awards which will be available next year (1959-60) includes an entry stating that an award in home economics may be available through affiliation with the Institut National

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Vitamin A	555 units
Vitamin D	55 units
Ascorbic acid	33 mg.
Thiamine hydrochloride	1.1 mg.
Riboflavin	1.1 mg.
Niacinamide	11 mg.
Calcium pantothenate	4.5 mg.
Pyridoxine hydrochloride	0.6 mg.
Folic acid	0.3 mg.
Choline bitartrate	55 mg.
Vitamin B_{12}	0.5 mcg.
Minerals	
Iron (from ferrous sulfate)	1.7 mg.
Calcium	700 mg.
Phosphorus	500 mg.
Sodium	210 mg.
Potassium	770 mg.

*Made with ⅔ cup Sustagen powder (100 gm.) and ⅔ cup water.

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a single food complete in all known essential nutrients

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Sustagen is made from powdered whole milk, non-fat milk solids, calcium caseinate, Dextri-Maltose® and dextrose, plus vitamins and iron. Each gram supplies 3.9 calories.

The booklet "Recipes for Sustagen Beverages" tells your patients how easy it is to prepare flavorful drinks. For your copies, you are cordially invited to ask your Mead Johnson Representative or write to us, Evansville 21, Ind.

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d'Hygiene of France. A person specializing in nutrition, consumer education, or institution management would be considered. Fluent French is essential. Further information may be obtained from the Conference Board of Associated Research Councils, Committee on International Exchange of Persons, 2101 Constitution Avenue, Washington 25, D.C.

Bulletin on Staphylococcus Infections in Hospitals. The American Hospital Association has issued as Bulletin 1, "Prevention and Control of Staphylococcus Infections in Hospitals." It has been released in view of the increasing problem of staphylococcal infections in hospitals and the consequent need for publicizing these recommendations approved by the AHA Board of Trustees. Of particular interest to the department of dietetics is the following recommendation:

Hospital administration should undertake the following measures to assist in the control of infections:

.. Diligent maintenance of the general cleanliness of *all* areas in the hospital, not simply in those associated with operating rooms, delivery rooms, and nurseries. Other possible sources, such as dust, air pollution (special attention should be given to ventilating and air-conditioning systems and their filters), and floors must also be considered as potentially important factors in the spread of infection. There should be regular inspections of the hospital for general cleanliness.

.. Special studies among staff and personnel to uncover silent carriers of staphylococcus, especially in epidemic situations accompanied by repeated cases traceable to the same organism.

.. Appropriate measures for the treatment of all carriers who persistently show heavy growth of epidemic strains of staphylococcus in nasopharyngeal cultures or who are identified by epidemiological evidence.

.. Transfer of such carriers and personnel with skin infections, boils, acute upper respiratory infections, and the like from locations such as operating rooms, delivery rooms, food-handling positions, and nurseries to other duty stations in the hospital. Usually such transfers have proved to be sufficient to control the problem, but occasionally leave of absence for a persistent carrier has been necessary.

U.S.D.A. Release. *Recipes for Quantity Service* is the title of the 225-page Home Economics Research Report No. 5 of the U.S.D.A. Some two hundred fifty recipes are presented, each in terms of 25, 50, and 100 portions. All have been not only laboratory tested, but also tested for practicability, sales appeal, and consumer acceptance in commercial and other types of food service. This compilation brings together recipes previously issued in ten other government publications, as well as a number of new ones and general information on food preparation. One page is devoted to portion control. Time tables for braising, roasting, and stewing meats are presented in addition to the individual recipes. A variety of menu items from soup and main dishes to desserts are included. Copies of this new publication may be ordered from the Government Printing Office, Washington 25, D.C., for $2.50 each.

FAO/WHO Reports. Two new reports issued jointly by the Food and Agriculture Organization and the World Health Organization of the United Nations have been received in the JOURNAL office.

The first, *Report of an International Seminar on Education in Health and Nutrition*, was prepared by F. W. Clements following the joint FAO/WHO meeting at Baguio, Philippines, October 13 to November 3, 1955. In it, the author, who was Chairman of the seminar, attempts to record the thinking and reactions of the group in their discussions of common problems in the field of health and nutrition education. The report is divided into three parts. The first tells the story of the seminar briefly.

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The new "Side-by-Side" steamer readily accommodates 12 x 20 inch containers of 4, 6, or 8 inch depths and 18 x 26 inch flat bake trays.

Lower steaming compartments simplify handling of all containers. Every compartment is easy to reach. The "Side-by-Side" steamer is available in two, three, and four compartment units: also in models for gas, electric, or direct-connected steam operation.

For complete detailed information and specifications write to:

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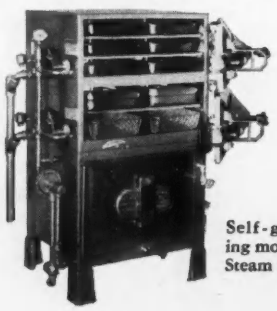

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Part II contains detailed reports of the topics discussed, including "Learning about People," "Learning and Teaching," "How to Develop Health and Nutrition Education Programmes," and "Evaluation." The last section consists of an appendix. This is FAO Nutrition Meetings Report Series No. 13 and may be ordered from International Documents Service, Columbia University Press, 2960 Broadway, New York 27, for $1 a copy.

The second new publication is *Procedures for the Testing of Intentional Food Additives to Establish Their Safety for Use* and is the second report of the Joint FAO/WHO Expert Committee on Food Additives. This report has been prepared to present a general picture of the information which should be available concerning any additive before its use in food is officially approved. A list of publications which have already appeared on this subject is included. This is FAO Nutrition Meetings Report Series No. 17 and World Health Organization Technical Report Series No. 144. Copies may be ordered for 30 cents each from International Documents Service, 2960 Broadway, New York 27.

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Length Overall 25" Height Overall 42"
Width Overall 21" Shelf Clearance 7"
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. . . the dietician's perfect answer to the age-old problem of transporting food to the patient and having it hot and appetizing on arrival. 4-tray unit combines mobility with stability . . . the two essential requirements in hot food delivery. Four double ball-bearing swivel casters with 5" ball-bearing rubber-tired wheels facilitate fluid motion, yet prevent chance of upset accidents or uneven motion that might slop or spill liquids. Swept-back handle makes it easy to maneuver without kicking the unit or bumping it with the knee.

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Popular Booklet on WHO. Albert Deutsch, noted health writer, has described the spectacular record of the World Health Organization in its first ten years in a new Public Affairs Booklet, *The World Health Organization—Its Global Battle Against Disease.* This dramatic report of accomplishment was prepared in advance of the Tenth Anniversary Conference of WHO held in Minneapolis late in May. Among the specific campaigns against disease waged by WHO have been the Asian flu, malaria, tuberculosis, yaws and other communicable diseases, trachoma and other eye diseases, water-borne diseases such as cholera and typhoid fever, mental illness, and the protection of maternal and infant health. Mr. Deutsch also emphasized the importance of WHO to the U.S.

Copies of this booklet, which is Public Affairs Pamphlet No. 265, may be ordered from the Public Affairs Committee, 22 East 38th Street, New York 16, for 25 cents each.

Food Conference Report. From the American Farm Bureau Federation, comes "A Narrative Report on the National Food Conference, Washington, D.C., February 24, 1958." This conference, widely publicized at the time, had as its theme, "Food Comes First." Two A.D.A. members participated as speakers at this conference: Adelia M. Beeuwkes, School of Public Health, University of Michigan, who spoke on eating habits of teen-agers; and Dr. Miriam E. Lowenberg, Pennsylvania State College, who discussed eating problems in childhood. Copies of this mimeographed report may be requested from the Federation, 2300 Merchandise Mart, Chicago 54.

Erratum. In the July issue of the JOURNAL, a typographical error was made in Table 4, page 714 of the article, "A Dietary Study in Haiti." The daily intake for cholesterol, in the last column, should have been indicated in terms of milligrams instead of grams.

News of State Associations

Illinois Dietetic Association. The final meeting of the 1957-58 season of the *Chicago Dietetic Association* was held at the University of Chicago Clinics on June 18. Dr. Philip Jackson, Department of Education, University of Chicago, spoke on "Deciding Future Capabilities." At the same meeting, Anna Boller Beach—A.D.A. Past-President, one of the founders of the Chicago Dietetic Association and 1957 recipient of the Marjorie Hulsizer Copher Award—was honored for her many professional achievements. Genevieve Anthony was named "Chicago Dietitian of the Year" "for leadership in the field of dietetics and participation in national and state dietetic pro-

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grams to acquaint the public with the advances being made in the field of dietetics today."

Louisiana Dietetic Association. New officers for 1958-59 for the Louisiana Dietetic Association, will be: President: Dorothy Bachemin, Southeastern Louisiana College, Hammond; President-Elect, Shirley Smith, Lafayete; Treasurer, Frances Hazzard, Shreveport; and Secretary, Emily Bullock, Baton Rouge.

Michigan Dietetic Association. The *Flint Dietetic Association* this year has conducted a campaign to kindle interest in dietetics. Cash awards were offered for the best projects related to nutrition entered in the Flint Science Fair, March 28 to 31. Dietitians entertained school counsellors early in October at a coffee hour, at which time announcement was made of the competition. Three cash prizes were offered to both the senior and junior high school students, and the school of the first prize winner in each division would also receive recognition in the form of books or cash. A dinner for prize winners and representatives of the schools of the two first prize winners was held at Hurley Hospital on April 14. In addition to the exhibits winning the awards, several other projects related to nutrition were considered worthy of recognition, and eight other participants were invited to the dinner and presented with cartridge fountain pens bearing the name of the student and of the Flint Dietetic Association.

Minnesota Dietetic Association. On May 15 and 16, the Minnesota Dietetic Association met in Minneapolis. The program included:

"Employee Training"—Frank Pieper, Office of Civil Service Personnel, University of Minnesota, Minneapolis

"The Role of Fat in Nutrition"—Jane M. Leichsenring, Ph.D., School of Home Economics, University of Minnesota, St. Paul

"The Geriatric Patient—Group Approach to Post Discharge Living"—Murray G. Berman, Social Work Service, VA Hospital, Minneapolis

"Pioneering as a Shared Dietitian"—LaDonna Eckstrom, Dietitian for Murray County Memorial Hospital, Slayton, Minnesota, and Ashton Memorial Hospital, Pipestone, Minnesota

"What Are the Continuing Education Opportunities for the Dietitian?"—a panel discussion

Missouri Dietetic Association. June 19 and 20 were the dates of a Continuing Education workshop in dietetics held at the University of Kansas Medical Center and co-sponsored by both the Missouri and Kansas Dietetic Associations. The program included:

"Group Relations" — Freda Dixon, Consultant, Kansas City Police Department

"What Is a Workshop?"—group participation

"Training Non-Professional Workers — Interpersonal Relationships" — Margaret Gillam, Michigan State University, East Lansing

"Visual Aids"—Dr. David S. Ruhe

"Integrated Education of Student Nurses"—Marguerite Pettee, University of Colorado Medical Center, Denver

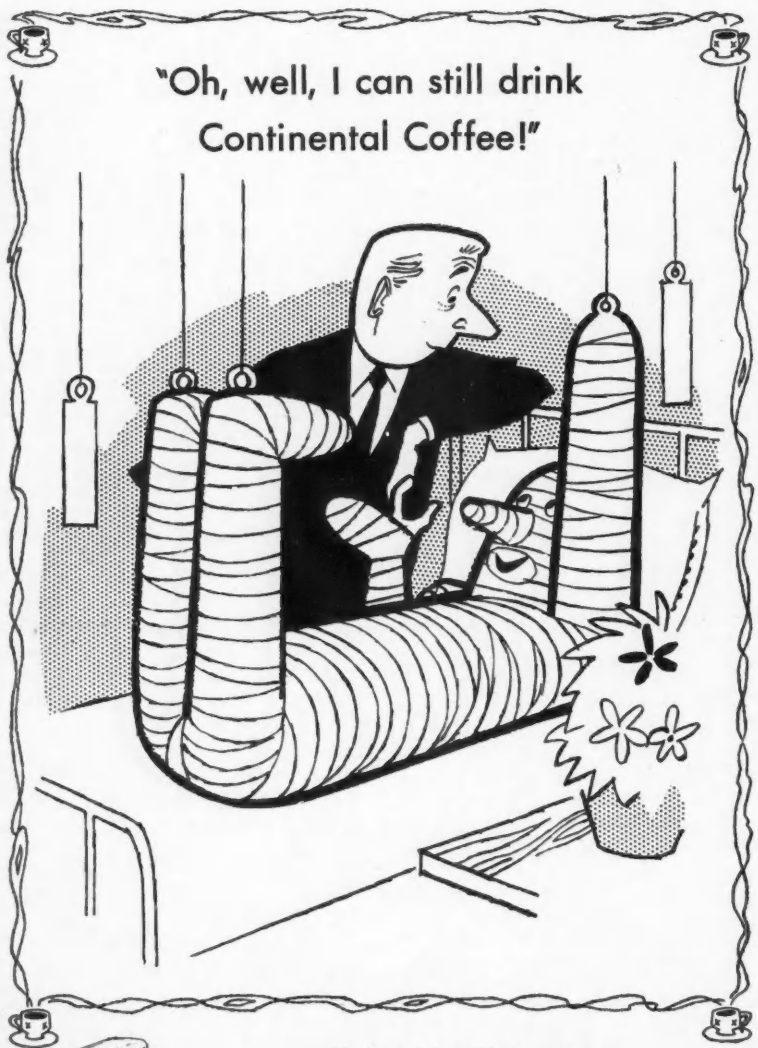
"Recent Research in Atherosclerosis" —Dr. George L. Curran

New Mexico Dietetic Association. The spring meeting of the New Mexico Dietetic Association was held in Albuquerque on March 11, in conjunction with the meeting of the state Hospital Association. The program included:

"Institutional Food Service"—Harold Miller, Director of School Lunch Program, Carlsbad

"Dental Caries Control—Planned Diet" —Beverly Collier, Clinical Nutritionist, Dairy Council of Northern New Mexico, Albuquerque

"The Future of Electronic Cooking in Hospitals" — Jean Bechtel, Chief Dietitian, and Ben Lucero, Meat Chef, Bataan Memorial Methodist Hospital, Albuquerque



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Pennsylvania Dietetic Association. Officers for 1958-59 of the Pennsylvania Dietetic Association will be: President, Margaret C. Madden, Philadelphia Psychiatric Hospital; President-Elect, Mabel Pluemacher, Bucknell University, Lewisburg; Treasurer, Marian Bryan, Visiting Nurse Society, Philadelphia; and Secretary, Natalina Scardamaglia, Women's Hospital of Philadelphia.

Vermont Dietetic Association. This spring the Vermont Association began publication of *The Vermont Dietitian*, an eight-page mimeographed bulletin which was sent to all members.

On May 24, members met in Burlington for a "Visit to the University of Vermont Family Care Unit."

Wisconsin Dietetic Association. April 18 and 19 were the dates of the Wisconsin Dietetic Association annual conference in Madison. The program was as follows:

"The Biology of Atherosclerosis"—Edgar S. Gordon, M.D.

"How to Set Up an In-Service Training Program"—Donald L. Kirkpatrick, Assistant Director, Management Institute, University of Wisconsin, Madison

"Allergy and Diet"—Mildred M. Stone, M.D., VA Hospital, Madison

"Reproduction and Elevation of the Blood Cholesterol Levels"—William B. Parsons, M.D., Director of Research, Jackson Clinic, Madison

"What's New in the Nutritional Field for the Student Nurse"—Dorothy Gailbraith, Marquette University, Milwaukee

Fern Gleiser, A.D.A. Delegate-at-Large and Past-President, attended the meeting as the national Association's representative.

Of special note at this meeting was the honor accorded Breta L. Griem for her "excellent service and high standards as editor of the *Wisconsin Dietitian* from 1946 to 1958." Mrs. Griem received a framed citation from the Wisconsin Association's President, Eleanor Gundlach.

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Association Activities

Broadening of A.D.A. Membership. The Committee to Study Broadening of A.D.A. Membership, with Helen Hunscher as Chairman, met in the Headquarters office in Chicago, June 19 and 20. Responses from colleges and universities were reviewed. It was gratifying to have a good return from both large and small colleges. These proved most helpful in planning academic roads to A.D.A membership. The Committee reviewed and revised its work on broadening the requirements of those applicants submitting experience in lieu of an approved A.D.A. internship.

A complete report will be made during our Annual Meeting in Philadelphia at the meeting of the House of Delegates on Monday, October 20, and at the Conference of Faculties and College and University Home Economics Departments and Approved Dietetic Internships on Thursday, October 23.

"Tree" Available. Available from the Headquarters office at 5 cents each is a copy of a "tree" of dietetics representing the growth of dietetics and the progressive diversity and specialization in dietetics. The original idea to show this development as a "tree" came from the Committee to Study Broadening of A.D.A. Membership. Orders will be filled as long as the supply lasts.

A.D.A. *Courier*. In addition to approximately 1200 national and state officers and section and committee chairmen regularly receiving the Courier, 220 members are now subscribers. As an A.D.A. member, the *Courier* is available to you—six issues per year—at $2 annually. A check mailed to Headquarters office will begin your subscription with the forthcoming issue.

Diabetic Diet Materials. These materials developed by the American Diabetes Association; Chronic Disease Program, Public Health Service, and our Association continue to be much in demand for patient use through the physician. The following materials are available *prepaid* from The American Dietetic Association:

Meal Planning with Exchange Lists (booklet)

INSIDE SCIENCE

LATEST REVISION

The Vital Story of MILLED WHITE RICE

Enriched with Vitamins and Iron for Better Health

by Science Writer

A second "Battle of Bataan" in the Philippines has proven beyond all doubt the value of vitamin enrichment to consumers of white rice.

The famous Bataan experiment in 1948-1950 proved conclusively that whole populations can benefit from enrichment of white rice with vitamins and iron, that disease and death caused by dietary deficiencies can be overcome, that enrichment is a key to better health among infants, children and adults.

What Happened at the Second "Battle of Bataan"

Before the start of the Bataan trial, these facts were evident:

- Polished white rice is the principal food of millions throughout the world. Good food though it is, it lacks several of the key nutrients occurring in the brown rice from which it is milled, and beriberi is often common where white rice is the main food.
- In the Philippines, beriberi was common and mortality from it high.

- Beriberi is caused by insufficient vitamin B_1 in the diet. It yields when vitamin B_1 is given to its victims. It does not occur when human beings receive enough of this vitamin in their diet.
- To prevent beriberi where white rice is the the main food, vitamin B_1 must be added to the diet, either by itself or in food such as rice.
- For centuries it has been universal practice to rinse rice before cooking, hence vitamin B_1 (and any other water-soluble nutrient factor) should be added in such a way that it will not dissolve out.
- Through a process developed in the laboratories of Hoffmann-La Roche, it is possible to enrich white rice with water-soluble vitamins and iron so they will not wash off during this rinsing prior to cooking.

With these facts known, the second "Battle of Bataan" began. Through the cooperation of Philippine public agencies, the Williams-Waterman Fund, the USPHS, and Hoffmann-La Roche a controlled experiment was set up in the province of Bataan. More than 12,000 medical examinations were made, before the enrichment of rice began. Nearly 13% of those examined had beriberi.

Enriched white rice was then put into commerce in the experimental area, but not in the control area.

What happened? *Within two years beriberi was practically wiped out in the experimental zone! . . .* beriberi mortality dropped almost to zero . . . almost 90% who had symptoms of the disease before enrichment's start were free from signs of the disease or were greatly improved . . . thousands of people were helped to better health. News of the success of enrichment reached people in the control area and caused them to demand that their rice be enriched, too.

Other Countries Follow Suit

Word of the excellent results of the Bataan experiment fanned out throughout the world. The largest rice miller in Thailand marketed enriched white rice with success in 1951. In that year, also, the Puerto Rican government enacted legislation requiring that all white rice sold there be enriched, beginning early in 1952. Since then, enriched rice has been made available to the public in Cuba, Venezuela, Colombia, The Dominican Republic, Taiwan (Formosa), Singapore, and Australia.

South Carolina First To Adopt Enrichment

South Carolina, a state having high per-capita white rice consumption, requires by law that all white rice sold there be enriched with vitamin B_1, niacin, and iron, with vitamin B_2 to be included at a later date. This state has required enrichment of white flour and corn meal since 1942 and 1943 respectively.

Federal Standards of Identity Now In Force

The U. S. Food & Drug Administration established the following Standards of Identity for enriched rice which must contain at least 85% of the minimum quantities, shown below, after a rinsing test. If the method of enrichment does not permit this rinsing requirement to be met, consumer size packages must bear the statement: "Do not rinse before, or drain after, cooking."

Vitamin	Milligrams per pound Min.	Max.
Thiamine	2.0	4.0
Riboflavin*	1.2	2.4
Niacin	16.0	32.0
Iron	13.0	26.0

*Optional pending further study

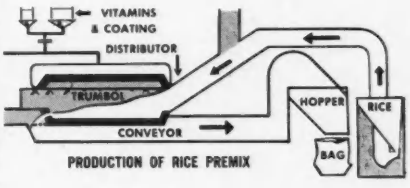
U. S. Federal Specification N-R 351 C requires the same content as the minimum standards shown above.

Popular brands of 'quick cooking' rice are now being enriched with all of the required vitamins.

How Is White Rice Enriched?

The enriching method in widest use throughout the world employs a method developed in the laboratories of Hoffmann-La Roche Inc., pioneers in the research and production of vitamins.

The Roche method impregnates rice grains with thiamine, niacin, (riboflavin, if desired), and iron and adds a final, outer coating of edible material to protect the vitamins against deterioration and preliminary washing and rinsing. For economy large amounts of vitamins are applied to small amounts of rice to make a "premix". One pound of the "premix" is then mixed with a larger quantity (usually 199 lbs.) of ordinary milled white rice at the mill.



PRODUCTION OF RICE PREMIX

What of the Future?

The trend to nutritionally-improved foods for better health is definite. The United States, a world-leader in the enrichment of white flour, white bread, corn meal and grits, farina, pastina, macaroni products, and breakfast cereals is now recognizing the need to enrich milled white rice. *When good foods are made better, everyone benefits.*

This article is part of series on the enrichment of processed cereal grain foods which are enriched for better nutrition. It is published by the Vitamin Division, Hoffmann-La Roche Inc., Nutley 10, New Jersey. An illustrated brochure containing the text of all articles in the series is available at your request without charge.

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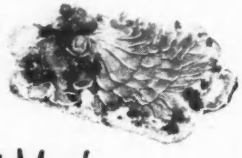

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A.D.A. Bland, Low-Fiber Diabetic Diet
Meal Plan No. 1—1200 calories
Meal Plan No. 2—1500 calories
Meal Plan No. 3—1800 calories
Meal Plan No. 4—2200 calories
Meal Plan No. 5—1800 calories
Meal Plan No. 6—2600 calories
Meal Plan No. 7—3500 calories
Meal Plan No. 8—2600 calories
Meal Plan No. 9—3000 calories

Meal Plans Nos. 5, 6, and 7 are especially suitable for children, as they contain more milk than the others.

Sodium-Restricted Booklets. Three new booklets on sodium-restricted diets, have been prepared cooperatively by the Public Health Service, American Heart Association, Council on Foods and Nutrition of the American Medical Association, The Nutrition Foundation, Inc., and The American Dietetic Association. They are:

Your 500 Milligram Sodium Diet
Your 1000 Milligram Sodium Diet
Your Mild Sodium-Restricted Diet

Our thanks go to two of our members, Beth Heap and Corinne Robinson, who developed the basic material in these booklets.

Professional persons or groups may obtain reference copies from their state or local health departments or heart associations, or from the Public Health Service, Washington, D.C.

WHO Meeting. Winifred H. Erickson, our representative to the Tenth Anniversary Meeting of the World Health Organization, held in Minneapolis, May 26 to June 14, reports several highlights of the Assembly.

Marion Folsom, former Secretary of Health, Education, and Welfare, commented that the U.S. will propose that WHO undertake a special study to find new ways to foster medical research on an international basis. Mr. Folsom pointed out the connection between world health and world economy, declaring that in large areas of the earth natural resources of great potential benefit lie largely untouched.

Present for the Assembly were 300 delegates from 88 nations and territories as well as approximately 3000 visitors.

American Diabetes Association. Alice Propst Hoover, Cleveland, attended the 18th Annual Meeting of the American Diabetes Association as Secretary of the House of Delegates of the American Diabetes Association and also as delegate of the Cleveland Diabetes Association.

Sister Maude Behrman, Atlantic City, New Jersey, delivered the invocation at the banquet of the meeting.

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This is a project of the Diet Therapy Section of The American Dietetic Association.

Single copy 50¢

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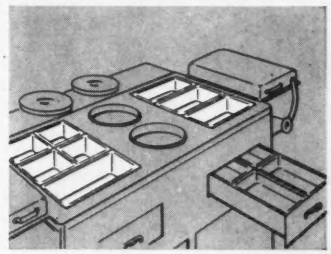
• You are ready for every food service requirement with Blickman-Built all-purpose food conveyors. Simply arrange the different sizes of square and rectangular insets in the top deck to suit the menu. For general service, you store the relatively limited variety of foods in larger insets. To handle the more diversified foods in selective menus and special diets, you replace the larger insets with a greater number of smaller ones. Round wells are also provided for soup, broth and potatoes.

• Seamless top and crevice-free body is standard construction in all Blickman-Built stainless steel food conveyers. These features offer notable benefits in sanitation and durability.

• The new Hi-Flo heating system cuts preheating time in half, assures piping hot foods for your patients.

A full complement of square and rectangular insets provides food storage for a wide variety of menus.

Rectangular wells accommodate a variety of inset combinations.



Another possible arrangement for top deck. Heated drawer holds special diet insets. Round insets are for soup, broth or potatoes.

Another variation showing use of one full-size pan at left and four insets in right-hand well.

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Long shelf and two rectangular pan covers provide work surface for loading trays.

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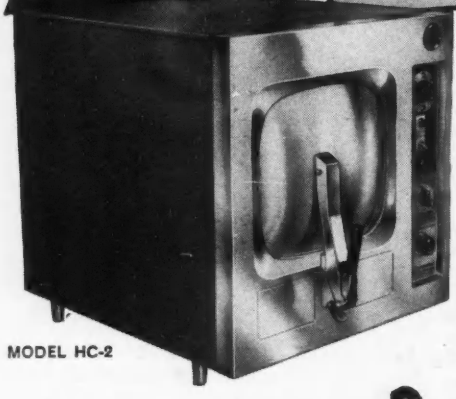

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A.D.A. Publications and Reprints. A revised *A.D.A. Publications and Reprints Listing* (July) is now available from Headquarters Office—single copies at no charge. Please send stamped, self-addressed envelopes. This listing includes selected A.D.A. reprints and other materials available in the categories of career information, administration, community nutrition, diet therapy, and education.

Obituaries

Kathryn Sell Robinson. The A.D.A. office has been notified of the death of Kathryn Sell Robinson in Kankakee, Illinois. Mrs. Robinson, who had been a member of the Association since 1941, had served on the staff of William Seymour Hospital, Eloise, Michigan; and St. Alexis Hospital, Cleveland, prior to moving to Kankakee. She had been employed in that city as Head Dietitian, Kankakee Clinic.

Ruth Hodde Watson. Word has been received of the death on April 8 of Ruth Hodde Watson of Bellaire, Texas. Before becoming a homemaker, Mrs. Watson had been employed at Hutchinson Commons of the University of Chicago. She became a member of the Association in 1949.

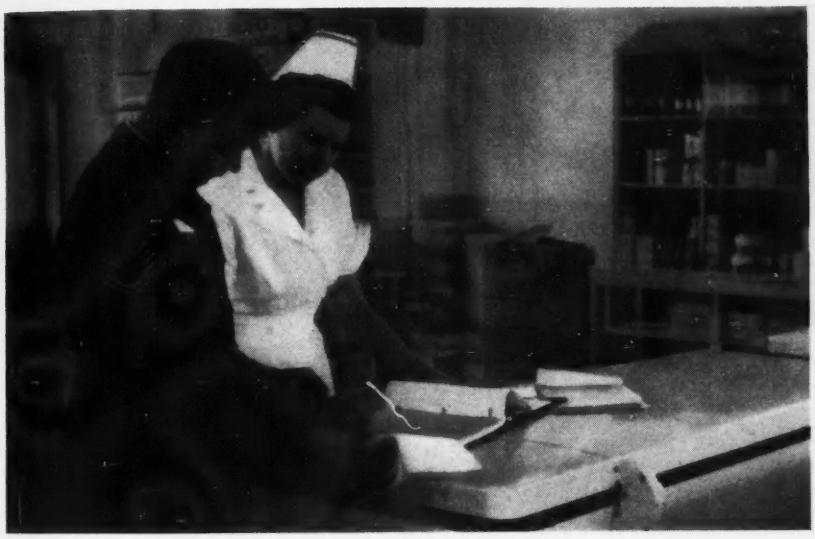
News of Products and Services

For institutional users, especially interested in low-portion costs, the *American Sheep Producers Council, Inc.*, has prepared *Low-Cost Lamb Recipes for Quantity Service.* It is Bulletin No. 1 in a new series and includes eleven recipes for: English lamb hot pot casserole, Italian lamb with spaghetti, baked cubed lamb and noodles au gratin, baked lamb rosettes with tomato topping, lamb luncheon roll with vegetable gravy, spring lamb à la king on crisp fried noodles, baked lamb slices Louisiana, upside down lamb pineapple loaf, fricassee of lamb and green peas on hot biscuits, "lambie pies," and Brunswick lamb stew on steamed rice. The recipes are given in terms of 25 and 100 servings.

A second publication from the *American Sheep Producers Council, Inc.*, was developed in cooperation with the National Restaurant Association. Titled *Something Different! Starring Today's Lamb*, it deals with problems of purchasing lamb, principles of cutting, boning costs and yields, making a cutting test, care and handling of lamb, portion control, and general methods for cooking lamb. There are in addition, two pages on how to use and cook lamb cuts and a double-page spread showing a carcass chart and the source of various cuts. The last eight pages of this booklet are devoted to recipes and planning lamb specialties. Three lists provide

BROADER HORIZONS

for you



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VEGETABLE SOUP

50 servings — 5 ounces each

INGREDIENTS

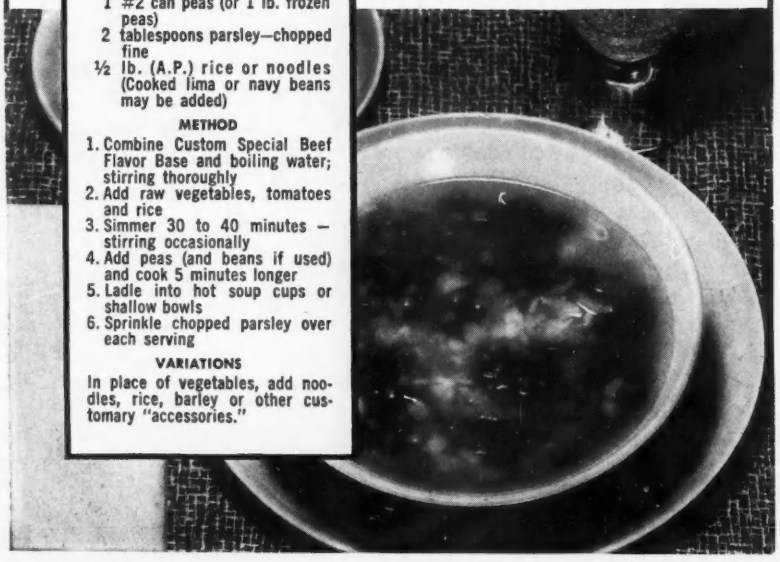
1-1 lb. jar Custom Special Beef Flavor Base
3 gals. boiling water
1 lb. diced carrots
1½ lbs. celery — diced
½ lb. onions — chopped fine
1 #10 can tomatoes
1 #2 can peas (or 1 lb. frozen peas)
2 tablespoons parsley—chopped fine
½ lb. (A.P.) rice or noodles (Cooked lima or navy beans may be added)

METHOD

1. Combine Custom Special Beef Flavor Base and boiling water; stirring thoroughly
2. Add raw vegetables, tomatoes and rice
3. Simmer 30 to 40 minutes — stirring occasionally
4. Add peas (and beans if used) and cook 5 minutes longer
5. Ladle into hot soup cups or shallow bowls
6. Sprinkle chopped parsley over each serving

VARIATIONS

In place of vegetables, add noodles, rice, barley or other customary "accessories."



ideas for low-, moderate-, and higher-portion cost dishes. The ten recipes are scaled for 25 portions. This release is Technical Bulletin Number 170 of the National Restaurant Association, but may be requested from the American Sheep Producers Council, Inc.

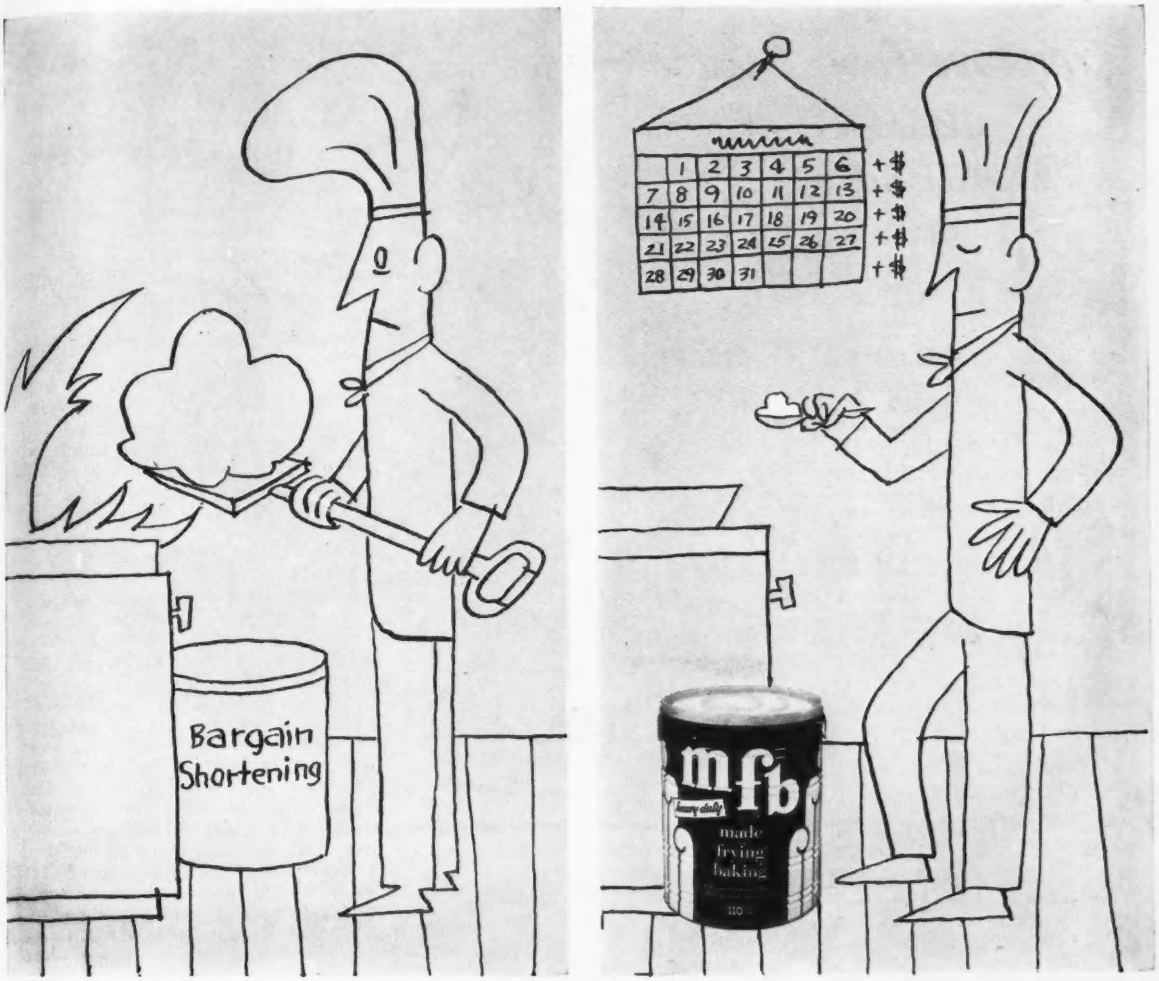
Louis Milani Foods, Inc., has introduced a new liquid extract of a blend of spices developed especially for use with sodium-restricted diets. Called "Diazest," it combines easily with soups, meats, fish, eggs, rice, potatoes, and vegetables. Four drops of Diazest —enough to season a serving of food —contain only ⅛ mg. sodium. It is produced under rigid laboratory control, and its low-sodium level is guaranteed as stated on the label. Another feature of Diazest is that it does not spoil or deteriorate.

An eight-page booklet, "Facts and Theories about Fats and Oils in the Diet," has been prepared by *The Wesson Oil People*. It is a reprint from an advertisement in the *Journal of the American Medical Association* and this JOURNAL. The booklet reviews what is known and what seems likely in the relation between coronary disease and dietary fats and oils.

Standard Brands Incorporated is developing for the institutional food service industry a program of "Tested Management Techniques," and now has ready the first course in the over-all program. Titled "How to Train by the Four Step Method," the course is 90 min. in length and is based on a two-day training program that Standard Brands has been giving its own managerial employees for several years. The highly compressed coverage is achieved through the use of a variety of visual aids, including two motion pictures and three film strips. The first movie is an animated color cartoon introducing the over-all "Tested Management Techniques" program and the "How to Train" technique covered in the first course. The three film strips explain and demonstrate: "9 Reasons Why Training Is Important," "Four-Step Training Method," and "How to Get Ready to Train." The second motion picture demonstrates "wrong" and "right" ways to train. The "How to Train" course is now available for presentation at regular or special meetings of dietetic or restaurant associations. Bookings may be arranged through Standard Brands field representatives or by writing to the Customer Service Department, Standard Brands Incorporated.

Cereal Institute, Inc., has published a sixty-seven-page review, *Cholesterol as Related to Atherosclerosis. A Review of the Literature, 1950 to July 1957*. The review was made by Helen I. Mattill, Ph.D., College of Medicine, State University of Iowa. The booklet is offered as a public service and is available on request.

Pet Milk Company has under construction a new Research and Development Center in Greenville,



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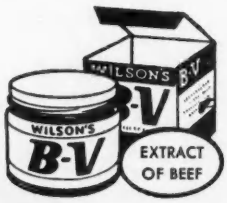

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Illinois, which is expected to be completed by late summer. Research activities in St. Louis will be continued and coordinated with those of the new Center in Greenville. The new structure will have eight major divisions: nutrition, bacteriology, basic chemistry, dehydrated products, evaporated milk, ice cream and frozen dairy products, frozen prepared foods, and engineering design. Assignments in the new building will center around investigation, experimentation, and pilot plant work basic to new product development, improving existing products, and application of new research findings to the business of the company. In addition to these research and development units, there will also be divisions for quality control and plant inspection.

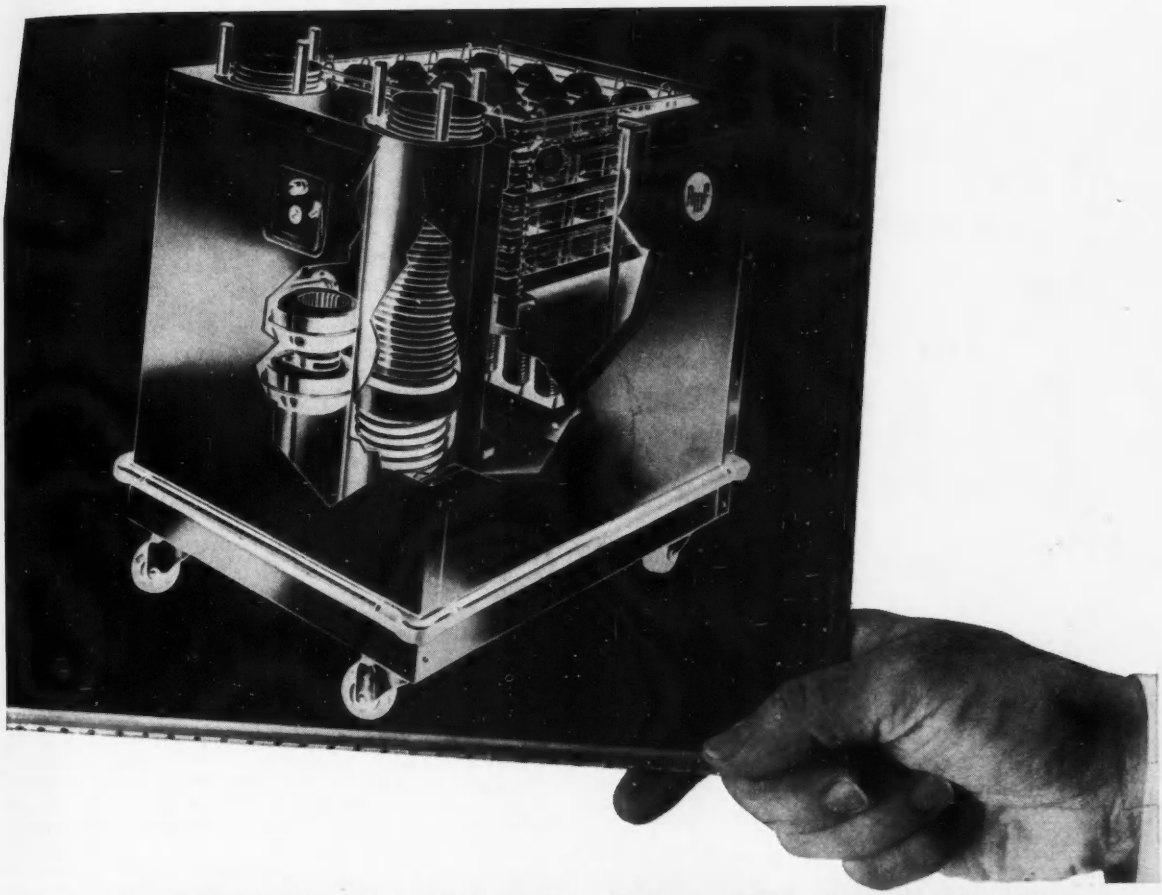
The *National Dairy Council* has revised its "A Guide to Good Eating" to adapt it to the U.S.D.A.'s new four food groups. The new Guide is attractive and illustrated with photographs of the various groupings: dairy foods; meat group, which includes cheese; vegetables and fruits; and breads and cereals. The Guide is available in three sizes: a wall chart measuring 18 by 28 in. a smaller chart 8½ by 11 in. and a hand-out size with helpful supplementary information on the back.

New to the *Kraft Foods* line of institutional foods are Spanish and ripe olives. The green olives are imported from Spain and are available in six sizes and varieties: large queen, jumbo queen, large stuffed, jumbo stuffed, large stuffed Manzanilla, and fancy pitted. All are packed in gallon glass jars. The Manzanilla olives are also available in quart jars. Spanish sweet pepper is generally used for stuffing. Three sizes of ripe olives are offered: large, jumbo, and colossal, all packed in No. 10 tins.

Pillsbury Mills, Inc., is using a new formula for five new cake mixes and a brownie mix for the institutional market. The formula, which incorporates "Turbo Milled" flour, produces higher (almost 4-in.), lighter cakes. Another new product for institutional use from Pillsbury is a Lemon Chiffon Pie Filling. With a true lemon flavor and excellent keeping qualities, it is also quick and easy to prepare. A 15-oz. package yields five 9-in. pies, at a food cost of less than 3½ cents per cut.

A new recipe idea service is also being offered to the institutional trade by *Pillsbury*. Suggestions for variety, using baking mixes, are pictured and sketched on recipe cards, with full instructions for volume preparation and serving tips. Table tents for use in promoting several of the recipes are also available.

For use in the higher grades and high school, *Merck & Co.* has prepared an "Enrichment Kit" consisting of three items. A small leaflet titled "The Slice of Life," gives in capsule form facts about bread, a crossword "grain game," two pages on planning lunches



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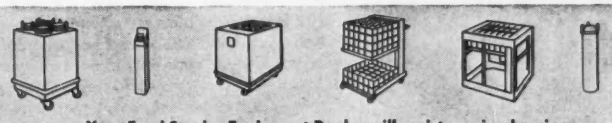
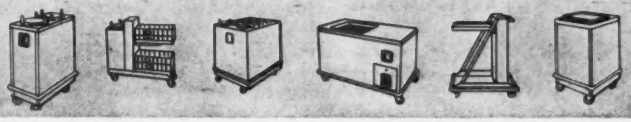


Your Food Service Equipment Dealer will assist you in planning the AMF Lowerator Dispenser System suited to your needs. Consult him or write for Catalog illustrating the complete AMF Lowerator Dispenser System.



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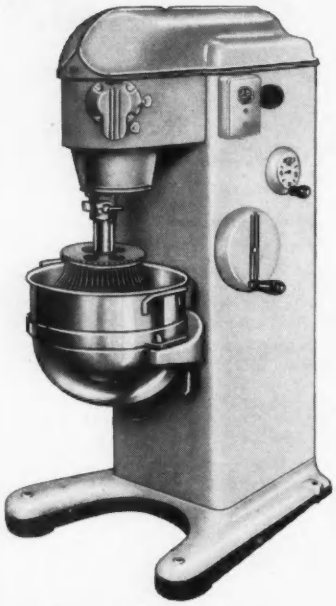

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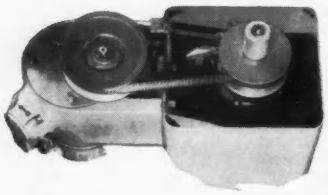

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with enriched bread, and a final evaluation chart for judging the value of packed lunches. The second is a larger booklet, "Enriched," which explains the structure of a grain of cereal and what happens to it when it is processed; what flour enrichment is; ways of using enriched bread and flour; and tables of the recommended allowances and comparative values of various foods. The third unit of the "Enrichment Kit" is a four-color wall poster, "What's for Lunch?" on which the four food groups are pictured, as well as four lunches which include foods from each group.

A 13½-min. film strip called "Bill's Better Breakfast Puppet Show," has been produced by the *Cereal Institute, Inc.*, for showing to elementary grade school children. In color and with sound, this 16 mm. motion picture is based on the Iowa University Breakfast Studies which stress the importance of a good breakfast for physical and mental efficiency. Prints may be borrowed from many state boards of health, departments of education, university film libraries, and schools' audio-visual departments. If not available from these sources, teachers, through their department head, may obtain a free print as a permanent loan from the *Cereal Institute, Inc.*

Continental Coffee Company announces a new seasoning salt. A blend of nineteen ingredients, the salt is good for roast, gravies, fish, eggs, poultry, steaks, chops, hamburgers, vegetables, salads, and cottage cheese. It may be used before or after cooking.

The Diversey Corporation is presenting the Model 10 Rinsemaster dishwashing machine for use in hospitals, hotels, and restaurants. It features a rinse injector with no moving parts developed to prevent water-spotting and streaking of mechanically-washed dishware. The new unit automatically injects a measured amount of Diversey Zerospot additive into the final rinse spray. Zerospot reduces the surface tension of the rinse water, which permits rapid drying without foaming or spotting. The Rinsemaster is said to operate equally well at water pressures as low as 2 lb. or up to 80 lb. and automatically adjusts for any changes in water pressure and flow conditions.

"Storage Properties of Vacuum Packed Coffee" has been released by *The Coffee Brewing Institute, Inc.*, as Publication No. 30. It reports a study on the effect of storage temperature and length of storage on vacuum packed coffee made by Dr. Ernest E. Lockhart, B. A. Cawley, M. C. Merritt, B. E. Proctor, and C. L. Tucker. The study established that vacuum packed coffee can be held in storage at varying temperatures up to twenty-seven months without any significant change in flavor.

Cereal Institute will again sponsor September as "Better Breakfast Month."